

Railway Age

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Breaking In Locomotives

NEW automobiles require "breaking in" by operation at reduced speeds for the first few hundred miles. It appears logical, therefore, that a new locomotive, or one just out of the shop after receiving heavy repairs, also should be thoroughly tested before assignment to heavy duty on a tonnage train. Most railroads "break in" newly repaired locomotives to a certain extent before placing them in regular service, but in some cases this trial period at reduced load and speed is entirely inadequate. It does not permit the moving parts to come to a good bearing against each other before being subjected to heavy pressures and as a result engine failures and incidental delays to trains occur. These are not only costly but detrimental to the railroad's prestige and standing with the public. One railroad system has considered this subject of "breaking in" locomotives of sufficient importance to justify extensive study and outlining in a circular letter of the methods to be followed in preliminary trials of the various classes of power on the different divisions. The plan outlined is designed to have sufficient flexibility so that division officers will not be relieved of the responsibility for seeing that locomotives are properly handled following receipt of heavy repairs and put in condition for satisfactory operation in regular service. The essential elements of the rules proposed by this road are (1) not less than seven hours actual light running time (2) speed not to exceed 25 miles an hour for the first 200 miles (3) load not in excess of 60 per cent. of the full tonnage rating for the initial trip. It is difficult to make hard and fast rules or specify the number of trips that a newly repaired locomotive should make in slow service before receiving a regular full tonnage assignment, but certain general rules can be laid down, subject to variations to suit local needs, which are bound to be beneficial.

Communication from Head-End to Rear-End Should Be Developed

FOR several years there has been considerable discussion of the possibility and the practical need for radio communication between an engineman in the cab of a locomotive and a conductor in the caboose of a long freight train. Having decided that apparatus could be developed to meet the requirements, Committee 12—Radio and Carrier Current Communication of the Telegraph and Telephone Section, A.R.A., is proceeding to develop the apparatus required, with the co-operation of manufacturers, and to determine whether such communication is of enough practical value in train operation to warrant the expenses of first cost and of maintenance. Following earlier demonstrations on the Virginian, a test on the Pennsylvania, using temporary wire connections over the cars, in February of this year, showed on a small scale the usefulness of such communication suffi-

cient to warrant further development. A recent test on the New York Central under the direction of the committee demonstrated the practicability of using radio apparatus for telephone communication on a long freight train. The consensus of opinion among railroad communication officers is that no great difficulty will be met in developing apparatus that can be installed and operated successfully in regular train service. Although many operating officers seem to be enthusiastic as to the benefits of such communication on freight trains, between different trains and also between trains and telegraph offices, it remains for this usefulness to be demonstrated on a larger scale. In view of the possibilities, development of this communication should not be allowed to lag. As a start, it would seem desirable for two or three roads to equip several engines and cabooses and then with the co-operation of the committee of the T. & T. section and the manufacturers, gradually to extend the system to include all engines, cabooses and telegraph stations on a division.

Why Railway Improvements Are Expensive

THE marked increase in the effectiveness of railway operation during the years since government control has been made possible in large part by large expenditures for facilities designed to increase traffic handling capacities. Practically all of the projects carried out to this end involve negotiations with public authorities, whether the object to be gained is a certificate of public convenience and necessity or the right to change the grade of a public highway. In lines through rural areas these dealings relate primarily to the condemnation of right-of-way or provisions for highway crossings, but in urban communities they concern a wide variety of considerations that have an important bearing on the ultimate cost of the improvements and impose on the engineer in charge the need for the exercise of no small degree of proficiency as a diplomat. However, even a past master in this particular line of endeavor usually finds in the end that he must accede to demands for supplemental improvements which add in no way to the value of the project from the standpoint of the railroad. For example, an eastern railroad was recently compelled to pave several miles of city streets in order to secure permission to make certain improvements, notwithstanding the fact that these particular streets are in no sense an adjunct to railway facilities. The motives prompting the imposition of exorbitant concessions of this kind from the railroads is but another manifestation of the state of mind which leads to the placing of fictitious values on land by appraisers in condemnation proceedings for additional right-of-way whereby lots in "Shantytown" bring prices equal to those on "Main street." While this tendency to "hold up" the railroads may be developed to a higher degree at present than in

years gone by, human nature has not experienced any marked change during the brief period of railway history. There is, therefore, no reason to believe that the experience of railway officers with public authorities was any different in the past from what it is now or that improvements carried out in earlier years involved any smaller proportion of extraneous expenditures than are necessary at present. These forgotten expenditures, of which there is now no physical trace, comprise an important element in the cost of the railroads but find no place in an appraisal for valuation purposes. That these were real expenditures is demonstrated by the day-to-day experience of the present time.

Motor Truck Regulation Feared By Shippers

THE attitude of shippers towards the regulation of the motor truck as a carrier of freight, as indicated by testimony of their representatives before the Interstate Commerce Commission in the motor transport investigation in Chicago and St. Paul, was among the most interesting facts brought out at the hearings. Their testimony was unanimous against truck regulation. Regulation of the motor bus as a common carrier of passengers was viewed in a different light. Witnesses were generally in accord in believing that the motor bus as a common carrier can and should be regulated. On the contrary, witnesses held, that the motor truck should not be strictly regulated even if it can be, which a number of the witnesses doubted. Most of the shippers favored regulation extending only so far as the issuance of certificates of convenience and necessity to truck operators and supervision over them to insure their ability to pay claims for damages. This attitude is not surprising. On the other hand, it is hard not to take a cynical view of it. Shippers apparently feel that the presence of so many persons eager to get into the motor truck operating game insures competition sufficient to keep rates at a low level and service at the maximum. They apparently feel that they can take care of themselves in every way except in the matter of payment of claims, and to this extent they are willing to accept governmental aid. Only one dissenting voice was heard from the ranks of the shippers. This was that of a farmer who ships milk to Chicago by truck and who testified that truck operators have made their charges for such transportation excessive since milk train service has been withdrawn by the railways. While the merits of his contention are not definitely established, it is reasonable, at least, to think that they may be true. It is also reasonable to believe that the recurrence of such a situation affecting shippers of other products may tend to amend their attitude, now so strongly in opposition to regulation of rates and service. There is merit in the contention that the flexibility and elasticity of the motor truck as a carrier should not be obstructed by regulation. There is also merit in the contention from the other side that the interests of shippers, the long established carriers and of the truck operators themselves, will be served best if some form of regulation of rates and service and right to operate is adopted. When its investigation is completed the Interstate Commerce Commission will be in a position to determine with a great degree of accuracy what regulation, if any, of the motor truck and the motor bus is required, not by the welfare of one group or another, but by the welfare of the public and carriers of all kinds.

Railroads and Public Utilities in the West

SOME significant and unquestionably accurate observations regarding public sentiment in Iowa regarding public utilities and the railroads are recorded by Arthur Evans, a capable correspondent of the Chicago Tribune, who has been traveling and talking with people in that state. He finds that "about 7 or 8 per cent is deemed a reasonable enough return for public utilities, but 6 per cent for the railroads is extortionate." He says: "The friendly feeling towards the utilities is ascribed to modernized publicity methods and closer public relationship, while antagonism, not to say hostility, towards the rails is a hangover from granger days." He concludes from the best available statistics that fully 80 per cent of the capital invested in Iowa public utilities is from outside the state, and that the main reason why sentiment is more friendly to the utilities than to the railroads is that the railroads have not shown the knack of the utilities in taking their case to the people." He adds, "Whenever Brookhart tears into the 'six per cent guarantee' of the railroads he rolls up votes in cities and towns that have given franchises to utilities on a 7 or 8 per cent return basis."

Mr. Evans refers to one fact which largely explains the difference that still exists in Iowa and many other western states in the sentiment toward public utilities and railroads. This is that the hostile sentiment toward the railroads dates much farther back and became much deeper rooted than any that ever existed toward public utilities. The attacks upon the railroads began in the granger days fifty years ago. They have continued ever since. As Mr. Evans says, twenty-five years ago "the late Senator Cummins was a terrific railroad biter. His old speeches make Smith W. Brookhart's utterances sound like a gospel hymn." One generation after another in western states was nurtured and reared on the doctrine that it should suspect, fear and hate the railroads until this doctrine was almost as generally accepted as the Christian religion.

Furthermore, the service rendered by most public utilities is more local than that of railroads, and they serve principally people in cities and towns, who are comparatively easy to reach. The railroads have also to serve the farmers, who always have mainly dictated railroad legislation in the west, whose minds became more poisoned against the railroads than those of any other class of people, and who, because they are scattered over more territory, are much harder than city and town people to reach with information and arguments that will modify their opinion. Within recent years, also, western farmers have suffered more from adversity than the people of cities and towns. They are naturally, therefore, harder to convince that they ought to be willing to pay the prices and rates for service made necessary by post-war conditions. Most other industries not being subject to regulation, the farmers have been unable to avoid paying them the going prices, but the rates of the railways are subject to regulation, and therefore western farmers, animated by a hostile sentiment that already existed, have concentrated their efforts on keeping down railroad rates regardless of the effects on the railroads.

We believe the western railways have been as successful as the public utilities in western territory in winning a friendly public sentiment among people living in cities and towns. They have also succeeded within the last five years in greatly changing the sentiment of the farmers. They simply have not succeeded in changing it

enough. The recent decision of the Interstate Commerce Commission in the western railway rate case undoubtedly was mainly due to the sentiment among the farmers against an advance in rates.

There is plainly no good reason, as Mr. Evans implies, why public utilities in western territory should be given valuations based largely on the cost of reproduction and allowed to earn returns of 7 or 8 per cent on these valuations, while the railroads are restricted to rates that yield them an average of only about 4 per cent on a property investment account that undoubtedly is much less than a fair valuation of their properties would be. In the long run such regulation of the railways will so restrict their development as to restrict progress of all kinds in the west. The wheat farmers of the southwest recently had a narrow escape from heavy losses because they delivered their wheat to elevators and country stations so fast that it was almost impossible for the railroads to cope with it. Only a year ago the same thing happened to the wheat farmers of the northwest. It will be only by the greatest efforts and the closest co-operation with the shippers that the railroads will be able to handle this year the fruit and vegetable crops of the west.

The greatest problem of the western railways is to convince western farmers and railway regulating authorities that the policy now followed in regulating the rates of western railways is not only grossly unfair, but in the long run will inevitably lead to disaster for all who are dependent upon the western lines for service. Progress is being made toward a solution of that problem, but it is still far from solved, and it never will be solved unless the railways continue and intensify their efforts to enlighten the farmers regarding railway matters, and to destroy the anti-railway sentiment by which they are still largely influenced.

Operating Efficiency and Dead Weight in Trains

THE operating results secured by the railways of the United States in May, 1926, surpassed those ever attained by them in any previous month in history. This fact is disclosed by the Interstate Commerce Commission's operating statistics for that month, which have just become available. The previous best record was that of August, 1925. The average number of cars per freight train in May was 46, as compared with 45.6 in August. The average net tons of freight per train was only 771, as compared with 796 in August, but the average speed at which freight trains were moved was over 12.2 miles per hour, as compared with 11.8 in August, and in consequence the average amount of freight service rendered by each train hourly in May was 9,526 tons carried one mile, as compared with 9,393 in August. "Gross tonnage" includes the weight of cars as well as freight. The average number of gross tons moved one mile in each train in May was 21,656, as compared with 20,828 in August.

The progress that has been and still is being made in increasing operating efficiency can be still better indicated by comparing the railways' performance in May, 1926, with that for May in previous years when they handled a large traffic in the spring months. Net ton-miles per train hour in May, 1920, were 7,802; in 1923, 7,999; in 1925, 9,222, and in 1926, 9,526. It will be seen that the increase in May, 1926, over May, 1920, was 22 per cent; over May, 1923, 19 per cent, and over May,

1925, about 3 per cent. Gross ton-miles per train hour were, in May, 1920, 15,876; 1923, 17,181; 1925, 20,709; and 1926, 21,656. The increase in May, 1926, over May, 1920, was 36 per cent; over May, 1923, 26 per cent, and over May, 1925, 4.6 per cent.

The foregoing statistics illustrate the effects that have been produced upon railway operation by the large capital expenditures made within recent years in improving equipment and other facilities and by the advances in operating methods that have gone hand in hand with these improvements and which the physical improvements have largely made possible. They are an especially significant commentary upon the effects that have been produced by the installation of larger and better locomotives and the successful efforts that have been made to utilize locomotives better.

The improvements that have been made in railway plants and in operating methods mainly explain the substantial increases in net operating income that are occurring. The total earnings of the railways in May, 1923, were \$547,300,000; in May, 1925, \$489,000,000, or \$58,000,000 less than in 1923, and in May, 1926, \$517,400,000, or \$30,000,000 less than in May, 1923; but the net operating income earned in May, 1926, was only about \$1,900,000 less than in May, 1923, and was \$12,000,000 greater than in May, 1925. This was due, of course, to the fact that operating expenses were much lower than in May, 1923, and that the increase in expenses over May, 1925, was much smaller than the increase in total traffic and earnings.

While the operating results being secured by the railways are gratifying, they disclose certain tendencies which clearly should be corrected if there are any practical correctives for them. The increase within recent years in *gross ton-miles per train hour* has been relatively much greater than the increase in *net ton-miles per train hour*. This is due, of course, to the fact that the amount of dead weight carried in the average train has been increasing much faster than the amount of freight handled. The general trend is illustrated by the statistics for May of each of the last seven years given in the accompanying table showing average cars per train, average gross tons per train, average net tons per train, average weight of cars per train and the amount by which the weight of the cars has exceeded the weight of the freight.

TABLE I

| Month of May | Average Cars Per Freight Train | Average Gross Tons Per Train (Excluding Loco. and Tender) | Average Net Tons Per Train | Average Weight of Cars, Tons | Excess Weight of Cars Over Net— Tons Per Train |
|-----------------|---|---|-------------------------------------|------------------------------------|--|
| 1920 | 37.1 | 1,470 | 725 | 745 | 20 |
| 1921 | 39.1 | 1,471 | 674 | 797 | 123 |
| 1922 | 39.4 | 1,443 | 635 | 808 | 173 |
| 1923 | 40.7 | 1,562 | 726 | 836 | 110 |
| 1924 | 42.1 | 1,582 | 703 | 879 | 176 |
| 1925 | 44.6 | 1,695 | 755 | 940 | 185 |
| 1926 | 46 | 1,754 | 771 | 983 | 212 |

It will be seen that in May, 1920, the average gross train load consisted of 725 tons of freight and 745 tons of freight cars, the excess of the weight of cars over the weight of freight being only 25 tons. The statistics for 1921 and 1922 have little significance because they were years of depression. In May, 1923, the weight of cars exceeded that of the freight carried by 110 tons; in May, 1925, by 185 tons, and in May, 1926, by 212 tons. Between May, 1920, and May, 1926, the increase in the average gross train load was 284 tons, but the increase in the freight carried was only 46 tons, while the increase in weight of cars was 238 tons. In other words, of the total increase in the gross train load, only 16 per cent was due to increase in the amount of freight transported,

while 84 per cent was due to increase in the weight of the cars hauled in the train.

One cause of this has been the decline in the average load per loaded car, which in May, 1920, was 29.2; in 1923, 28; in 1925, 26.9, and in 1926, 26.8. The statistics of the Car Service Division indicate that this decline in average tons per loaded car has been due to the fact that light loading traffic has been increasing relatively faster than heavy loading traffic. They also disclose, however, that there have been few increases in the average loading per car of commodities shipped in car load quantities, and that such as have occurred have been offset by declines in the loading of other commodities. The railways have been increasing the average capacities of the various kinds of cars, and have not been getting corresponding increases in the loading of the various commodities hauled in them.

Another cause of the large increase in the dead weight as compared with the freight hauled per train has been the increase in empty freight car mileage. In May, 1920, only 29 per cent of freight cars were moved empty, or the equivalent of 10.76 cars per train. In May, 1923, this had increased to 34.7 per cent, or the equivalent of 14 cars per train, and in May, 1926, to 36 per cent, or the equivalent of 16.56 cars per train.

The increase in the average capacity of cars has been accompanied by an increase in their average weight. The statistics given in the accompanying table indicate that in 1920 the average freight car weighed empty about 20 tons; in 1923, about 20½ tons; and in 1926, about 21.4 tons. If there had been no increase between May, 1920, and May, 1926, in the proportion of empty cars per average train, and there had been the same decline in tons per loaded car and increase in the total number of cars per average train that actually occurred, the increase in tons of freight per train would have been 150 as compared with an increase in dead weight of cars of 238 tons. If there had been between May, 1923, and May, 1926, no increase in the proportion of empty cars per train, but the same decline in tons per loaded car and increase in the total number of cars per train that actually did occur, there would have been an increase of 78 tons of freight per train as compared with an increase of 147 tons in dead weight of cars. It will be seen, therefore, that in the absence of any increase in the proportion of freight cars moved empty there would have been a relatively much greater increase in the dead weight of cars per train than in the average load of freight per train.

The record of increases in efficiency which the railways have been making is highly gratifying. The facts given regarding the disparity between the increases in dead load and in paying load per train and its causes show, however, that the record is by no means entirely satisfactory.

The situation calls for more intensive study of means of curtailing empty mileage than ever has been given to that subject. It is also apparent that whether the steady increase in the average weight of cars that is occurring is justifiable demands investigation. There can be only two good reasons for increasing the weight of cars. One of these is to strengthen them so that they can be safely used in long trains. The other is to enlarge their capacity so that more freight can and will be loaded in them. The number of cars handled per train is increasing. On the other hand, while the average capacity of cars is being increased, and this increase is being accompanied by an increase in their weight, there are, as already stated, practically no increases occurring in the loading of commodities. The result is that the railways are incurring the cost of hauling additional car weight with-

out apparently getting any additional revenues to compensate for the cost incurred.

The developments which, between May, 1920, and May, 1926, caused 84 per cent of the increase in the gross tonnage per train to consist of increase in the weight of cars and only 16 per cent of it to consist of increase in freight hauled, call for investigation and action by at least three departments of the railroads. What can be done to stop the increase in empty car mileage and bring about a reduction of it is a problem that demands attention from the operating department. What can be done to increase the loading of cars demands attention from the traffic department. What, if anything, should be done to arrest increases in the weight of cars demands attention from the mechanical department.

The railways should not go on increasing the dead weight hauled in trains much more in proportion than they increase the freight hauled unless thorough investigation by all the departments directly concerned shows that this trend is due to controlling economic developments and cannot be arrested without adverse effects on operating efficiency and on the freight service rendered to the public.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,
Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Decisions of the Interstate Commerce Commission of the United States, May-July, 1925, Vol. 100. This volume includes the decisions in the Southern class rate investigation, several other southern rate cases, and the Los Angeles passenger terminal cases. 901 p. Pub. by Govt. Print. Off., Washington, D. C. \$2.25.

How a Railroad Uses Motor Cars, by Elisha Lee. 4 p. Pub. by Pennsylvania Railroad, Philadelphia.

How Railroads Advertise Communities, by C. B. Sudborough. 7 p. Pub. by Pennsylvania Railroad, Philadelphia.

Railroad Equipment Securities, by Elbridge Wason. [Reprinted from Barron's Weekly.] A brief history of this method of financing equipment and an analysis of issues outstanding. 24 p. Pub. by Old Colony Trust Co., Boston, Mass. Apply.

Periodical Articles

As New England Figures in the News, by Frederick G. Fassett. Boston Evening Transcript, August 2, 1926. p. 13.

Autoless Bermuda Accepts a Railway, by Walter B. Hayward. New York Times Magazines, August 1, 1926. p. 5, 23.

The Engineering Scene, by William E. Wickenden. Characteristics of technical education in European countries and what we may profitably learn from it. Mechanical Engineering, August, 1926. p. 794-796.

Modernity from a Car Window, by Charles F. Talman. Some of the less-known railroad equipment illustrated and described. Outlook, July 28, 1926. p. 440-441.

Now They Try Faith, by Sherman Rogers. Discussion of Watson-Parker bill. Success, August, 1926. p. 48-50, 104.

The Plight of the Little Railroad, by Edward Hungerford. Discussion of proposed abandonment of small railroads and their attempts to carry on. Country Gentleman, August, 1926. p. 3-4, 77-78.

Present Tendencies in Engineering Materials, by John A. Mathews. Comment on specifications and what they should embody. Mechanical engineering, August, 1926. p. 791-794.

Three Years of the "B. & O. Plan," by O. S. Beyer, Jr., New Republic, August 4, 1926. p. 298-300.



Looking from the Hump Over the Northbound Classification Yard

Illinois Central Completes Markham Yard*

Extensive track layout and complete engine and car repair facilities solve a growing freight terminal problem

AFTER years of anticipation and planning, dating back to 1907, and practically nine years of actual construction, the Illinois Central has recently completed and put in operation one of the largest and most complete classification yards in the country at a cost of millions of dollars. This yard, which is located on the outskirts of Chicago, and named "Markham" after the president of the road, was constructed to solve the Illinois Central's growing freight terminal problem which in recent years has assumed large proportions. The yard itself is three miles long and contains 112 miles of track with a total capacity of approximately 10,000 cars. Supplementing the yard is a complete modern engine terminal of permanent construction, suitably laid out and equipped to handle 100 locomotives every 24 hours.

At this yard, which is located between Homewood, Ill., and Harvey, 23 miles from Chicago, it is planned to handle all of the Illinois Central's north and southbound freight and power to and from Chicago, which will relieve materially the congestion in a number of their present cramped and outgrown facilities and minimize the amount of switching necessary within the city. While the location of the yard offers many operating advantages, two of the most important are that the yard lies south of most of the important interchange points with other roads entering Chicago, thereby avoiding back haul, and is sufficiently far south to form the electrifica-

tion terminal of the Illinois Central, where steam power operating from the south will be relieved eventually by electric power for operation into the city.

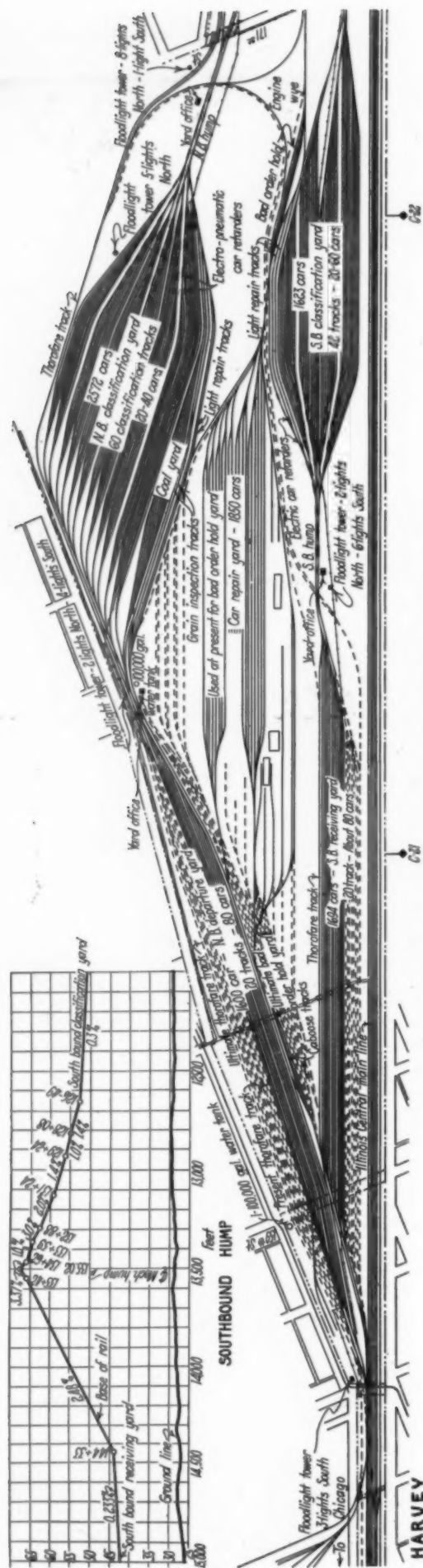
Layout of the Yard Facilities

Markham yard, which involved the purchase of 650 acres of land, is laid out on a three-mile strip of ground to the east of and paralleling the Illinois Central main line into Chicago. The principal yard facilities include receiving, classification and departure units for both north and southbound traffic, a large car repair yard and a complete modern engine terminal in addition to numerous auxiliary yard units. The entire yard at present contains 112 miles of track and has a capacity of over 9,700 cars. While this represents a complete unit of sufficient size to handle present business, the ultimate plans for the yard provide for 160 miles of tracks with a capacity of approximately 14,000 cars.

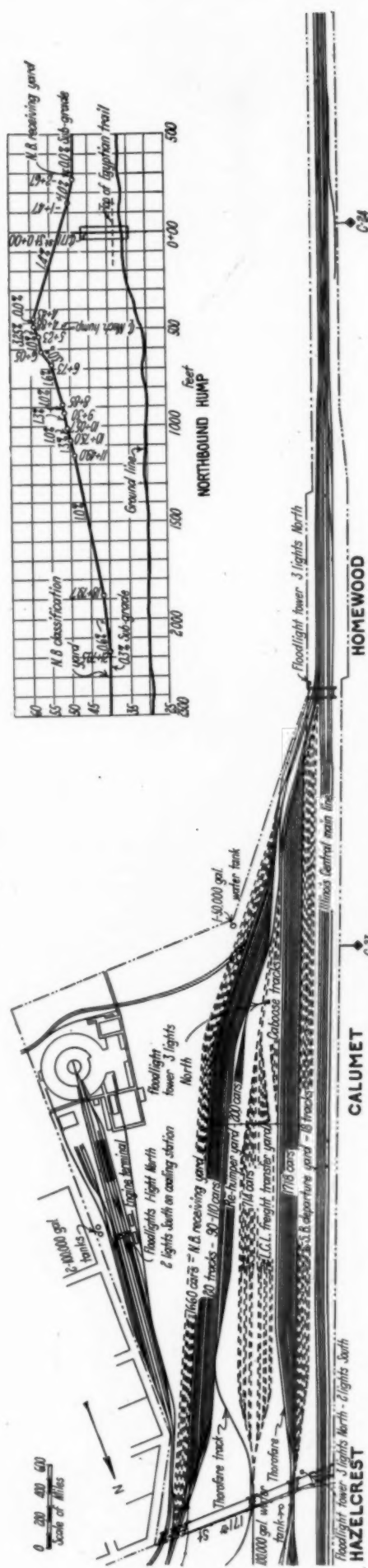
The northbound receiving yard, which will ultimately consist of 20 tracks, has 14 tracks at present. These tracks vary in capacity from 90 to 110 cars, their total capacity being 1,040 cars. The ultimate capacity of this unit will be 1,660 cars. Immediately adjoining this yard on the west is a grid of five tracks called the re-humper yard, for cars which have come from the southbound classification unit, but which must be re-classified in the northbound yard for northern connections. Each of the tracks in this yard, has a capacity of 40 cars.

From this yard and the northbound receiving yard

* Previous articles relative to the Markham Yard appeared in the RAILWAY AGE of May 10, 1918, and February 23, 1924.



Track Layout and Profile of the North Half of the Markham Yard



cars are sent over the hump into the northbound classification yard where there are 60 main classification tracks each holding from 20 to 40 cars. Twenty of these tracks are assigned for cars for connecting lines; 13 tracks for the various industrial districts located on the Illinois Central in the Chicago terminal district; 6 tracks for coal and miscellaneous loading held for orders or disposition; 5 tracks for company coal and other company material; 1 track for bad-order loads for transfer and adjustment; and 1 track for through cars west on the Illinois Central. The remaining 15 tracks in the main classification unit are being used for the most part for classifying cars, except commercial coal, for the downtown terminals.

In addition to these principal classifications, there is a grid of 13 short tracks for re-classifying commercial coal, 2 grain inspection tracks, 2 light repair tracks and a lead into the car repair "hold" yard. The main classification tracks are divided into groups of 10 with a ladder for each group at the hump end and a separate

space for 1,023 cars, while ultimate plans provide for 8 additional tracks affording a total capacity of 1,694 cars. From the receiving yard cars are pushed over the hump into the southbound classification yard, which, owing to the nature of the southbound traffic, contains longer tracks than the northbound classification yard, but only 42 classifications. These tracks have capacities ranging from 20 to 60 cars and a total capacity of 1,623 cars. Like the northbound classification yard, the southbound unit has two light repair tracks and a lead to a southbound bad order hold track.

The southbound departure yard consists of 10 tracks, each with a capacity of from 110 to 120 cars, although plans for the ultimate construction of additional tracks of approximately the same length will place the capacity of this unit at 1,718 cars. The long tracks in this unit have been provided primarily for the making up of long trains of empty coal cars moving south to the mines. As in the case of the northbound departure yard, additional tracks have been located conveniently for holding and



Looking From the Coaling Station Toward the Cinder Pits with the Roundhouse and Shop Buildings in the Distance

ladder for each 5 tracks at the lower end. This particular layout at the outlet end of the yard was made necessary because of property limitations which necessitated also the use of 10-deg. curves in connecting up the ladder tracks with the departure yard lead. The total capacity of the northbound classification yard is 2,572 cars.

The northbound departure yard, lying immediately north of the classification yard, consists at present of ten 80-car tracks, one-half of the ultimate planned trackage. Between this yard and the southbound receiving unit, which is directly to the west, caboose tracks have been located so that the cabooses dropped from southbound trains can be readily picked up and connected to those moving northward. At the north or outlet end of the departure yard, a complete air-testing plant has been installed to test and charge train air lines before the trains are forwarded.

The southbound units of Markham yard are somewhat similar to the northbound, the difference lying principally in the number and length of tracks provided. The receiving yard at present consists of 12 tracks with

the transferring of cabooses from northbound to southbound trains, and the outlet end of the yard is equipped with complete facilities for charging and testing trainlines before trains are sent out on the road.

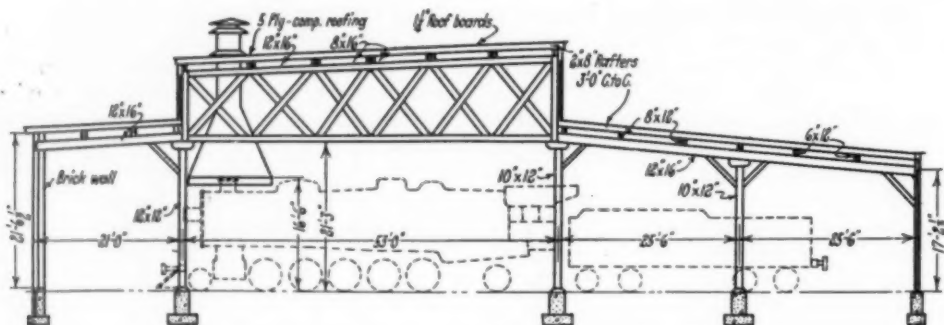
Thoroughfare tracks have been constructed throughout the yard for the movement of locomotives to and from the engine terminal. Two such tracks serve the north end of the yard, one lying along the east side of the northbound units and the other along the east side of the southbound classification and receiving yards. One thoroughfare track located along the west side of the northbound receiving unit serves the south end of the yard, although several movements are possible at this end as well as at the north end. A wye-connection in the thoroughfare tracks, opposite, and extending under the northbound hump, greatly increases the flexibility of handling locomotives and also provides for the turning of power if the turntable at the enginehouse should be out of working order.

The area between the northbound and southbound units is occupied by a large modern repair yard and in addition provides space for the construction of a large

less-than-car-load transfer terminal. The car repair facilities, which are approximately one-half completed, include a powerhouse, a large brick mill building equipped with modern machinery, and trackage for handling 1,180 bad order cars, including storage. All of the tracks in the present yard are served with overhead air lines, and repair sheds, concrete paving between the tracks, and electric lighting, have been planned. All of these facilities as well as the present trackage will be

hump whereby the initial grades may be increased or lessened as required by weather conditions.

While an extended study of hump operation was made in order to determine the proper grades necessary on the humps at Markham, several features peculiar to the yard layout and the character of loads handled, made it necessary to increase the grades on both humps beyond what was originally planned. The smaller alteration in grades occurred on the northbound hump where the



Section Through Enginehouse, Showing Roof Construction

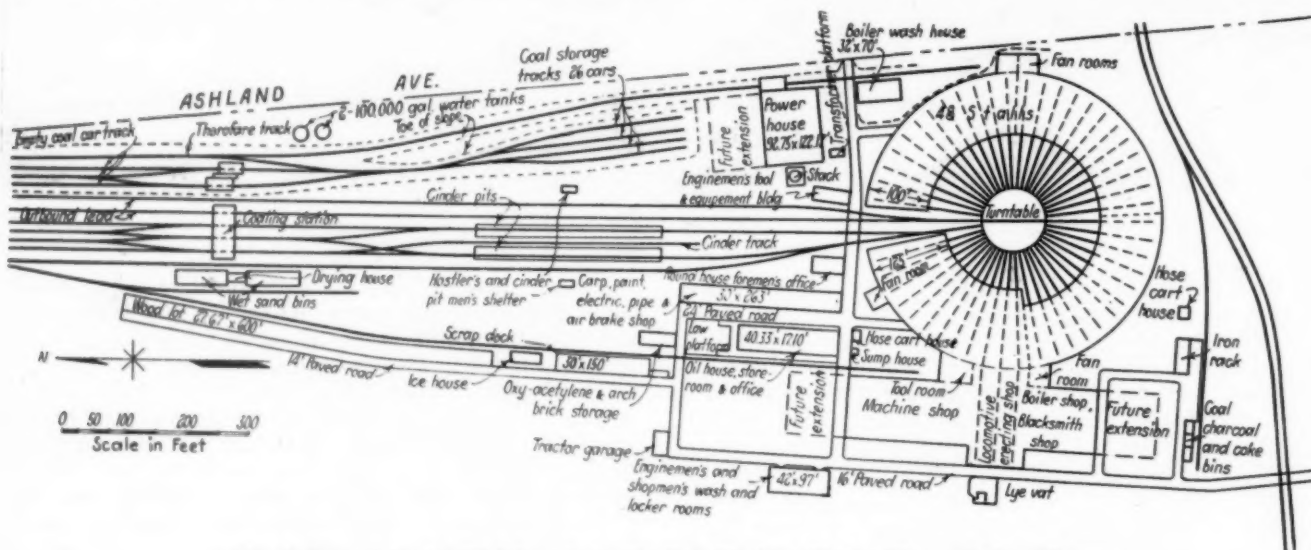
extended as necessity requires, to an ultimate capacity for handling 1,850 cars.

While work on the l.c.l. transfer terminal has not been started, pending definite plans for the rearrangement of the company's South Water street freight terminal in Chicago, tentative plans call for considerable trackage, served by five transfer platforms were l.c.l. shipments of merchandise and other material can be transferred and re-loaded or consolidated.

The Humps

The two humps at the Markham yard, with their facilities, are possibly one of the most interesting features

changes were made necessary in order to compensate for the curvature in the crossovers on the hump and in the lead tracks, while a considerable lift was required in the southbound hump to compensate for curvature and to provide sufficient momentum to the large number of southbound empties handled over this hump to carry them to the distant ends of the classification tracks. The grades as finally established on the hump involve a 1.4 per cent approach grade on the northbound hump and a 2.48 per cent grade on the southbound hump. The grades on the classification side of each hump, which vary from a steep initial slope to lighter gradient toward the foot, are shown on the accompanying profiles.



Track Layout in the Vicinity of the Coaling Station, Cinder Pits and Roundhouse

of the yard. These humps are graded up on slag and sand embankments, the northbound hump rising to a height of about 25 ft. above the lower end of the classification yard while the difference in elevation between the southbound hump and the lower end of the southbound classification yard is approximately 22 ft. Each hump carries two tracks, either of which can be used for humping cars. A five-section mechanical hump, operated by hydraulic jacks, is located at the summit of each

About 75 ft. from the mechanical hump, on descending grades of 1.0 per cent, the latest type of plates fulcrum scales, with automatic recording devices, have been installed, whereby all cars are weighed automatically as they pass, at speeds ranging from about 2 to 6 miles per hour.

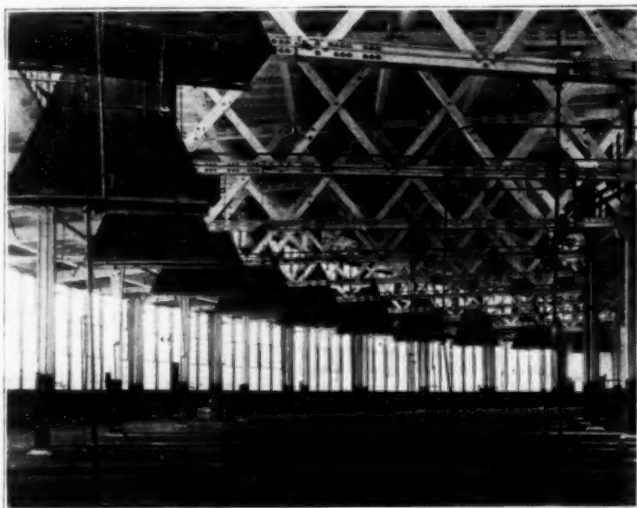
Movement from the receiving yard over both the north and southbound hump, is controlled by a three-light color light signal installed at the summit of each

hump, giving four indications—green, hump fast; yellow, hump slow; red, stop; and red and yellow, back up. A two-light color light signal mounted on the same mast governs switching engines in the classification yards with the two indication—green, trim; and red, stop. These signals are controlled in each case at the yardmaster's office on the humps.

Car Retarders Replace Car Riders

While the original plans for Markham yard contemplated the use of car riders on both the north and southbound humps, and while construction was practically completed on this basis, the subsequent development of the car retarder and its successful operation in the Gibson yard of the Indiana Harbor Belt Railway, led to its adoption for both humps at Markham.* Two types of retarders were installed, General Railway Signal Company's electric retarders in the southbound yard, and Union Switch & Signal Company's electro-pneumatic retarders in the northbound unit.†

The northbound classification unit at Markham has



The Interior of the Roundhouse

3,536 track ft. of retarders, divided into 121 units, while the southbound classification yard, owing to its fewer classifications, has only 2,432 ft. of retarders, separated into 79 units. In each case one retarder unit is located on the hump just ahead of the scale, while the other units are distributed on the descending lead tracks of each hump, and at the head of each classification track. In addition to the retarders, the northbound unit has five control towers located about the entrance to the yard where, by means of special desk type machines, the operators control the retarders as well as 69 switches and 65 skate-placing mechanisms. In the southbound unit four such towers and machines govern the retarders in addition to 45 switches and 43 skate mechanisms.

With the humps at sufficient heights to insure that the initial momentum given each car will carry it to its destination under unfavorable weather conditions, and with proper retardation taking care of the speed under favorable conditions, the principal changes in grade necessitated by the car retarders occurred in the classification yards where it was necessary to change the original grade of each track to a non-accelerating grade beyond the last retarder, so that when out of the control

of the retarder system, cars will move to their destination uniformly and at the rate at which they are released. This required slightly different grades for the long and short tracks of the yard. Through the center of the northbound classification yard the grade is established at 0.3 per cent.

Grading and Track Work

One of the largest and most prolonged items in the construction of Markham yard was the grading, which amounted to approximately 5,000,000 cu. yds. Much additional grading was avoided in the construction of the yard by taking advantage of the natural topography of the site which has a fall of about 50 ft. between the south end of the yard at Homewood and the north end at Harvey, or in the direction of the heavy tonnage. Taking advantage of the the slope of the natural ground, the maximum opposing gradient in the northbound section, aside from the hump, is 0.292 per cent, this being made necessary at the north end by the undergrade crossing at 159th street and the elevated main tracks at Harvey, while the maximum opposing gradient in the southbound section of the yard, except at the hump, is 0.785 per cent, this gradient being required in the vicinity of 171st street between the southbound classification and departure yards where it was necessary to elevate the tracks to permit an undergrade crossing.

Practically all of the grading at Markham was embankment, there being only one light cut in the southbound section near the Homewood end. Material for the embankment consisted primarily of sand, and industrial refuse collected in and about Chicago. All of this material was hauled to the site by cars which were dumped direct or unloaded by locomotive cranes. While swampy land, overlaying quicksand, covered a large area of the terminal site between the northbound hump and the main line, the trackwork through the yard was laid in much the usual manner without serious difficulties. All tracks were laid with 90-lb. rail, new rail being used on leads and relay rail in body tracks, except in the car repair yard where 85 lb. rail was used. Track centers throughout each of the main units of the yard are 13.5 ft., except where provision has been made for a pole line where the tracks are spaced 19 ft. center to center. The three wide spaces between the main groups of tracks in the northbound classification yard and the two in the southbound classification yard were originally provided for motor car tracks to return car riders to the humps. The tracks at these points are spaced 34 ft. center to center. All frogs in the yard are No. 8 and of the Conley self-guarded type.

Pneumatic Tubes, Teletype Printers and

Floodlighting Facilitate Operation

One of the unique features installed throughout Markham yard is the pneumatic type messenger system which connects up the various yard offices and the hump offices to facilitate the prompt delivery of way-bills and written orders. This system centers in the main yard office on 171st street between the north and southbound yards, from which six 3 in. and 4 in. tubes lead out, connecting with the small yard office on 171st street, the assistant yard master's office at the outlet end of the northbound classification yard, the scale houses on each hump and the yard offices at both the extreme north and south ends of the yard.

Metal cylindrical carriers about 1 ft. long are used as conveyors, these being forced through the various tubes by air pressures ranging from 6 lb. to 20 lb., the heaviest pressure being used only over the long routes. Two 400 cu. ft. air compressors supply the air at the central

* For a description of the Gibson yard installation, see *Railway Age*, November 15, 1924, and May 9, 1925.

† For a description of the General Railway Signal Company's car retarder system, see *Railway Age* of March 6, and for the Union Switch & Signal Company's car retarder system, see the issue of April 17.

station, and a small 250 cu. ft. compressor supplies it in the north end office. The other terminals of the system are furnished with air by Boston blower units which supply pressure sufficient to forward the carriers to the main yard office. This tube system was installed by the Lamson Company, Syracuse, N. Y.

Another modern method of communication throughout Markham yard is by means of the Teletype printers which have been installed at the main yard office and at each of the car retarder towers. These machines are of two types, transmitters, which perform the functions of a typewriter and telegraph key, and receiving machines which receive the messages in typed form. The receiving machines are located in the nine car retarder towers located in the northbound and southbound classification yards, while the transmitters, of which there are two, are in the main yard office at 171st street.

When waybills of an inbound train are received at the yard office via the pneumatic tube system, these bills are examined and checked and then switching list information is transmitted by one of the Teletype printers in one operation to all retarder operating towers concerned where it is received in the form of a typewritten list ready for use. Similar information is forwarded to the hump yard offices for use in making cuts, through the pneumatic tube connection. With this system of communication, switching lists are in the hands of the retarder operators and a train can be humped within from 20 to 30 min. after it enters one of the receiving yards. The Teletype printers were manufactured by the Morkum-Kleinschmidt Corporation, Chicago.

Supplementing the pneumatic tube system and the Teletype printers, all of the facilities throughout the yard and terminal are connected in an automatic telephone system which, in addition to providing direct communication at any hour, is used, through special recording machines, as a time clock system for night watchmen.

The vast expanse of Markham yard is lighted at night by a system of floodlights mounted on eight steel floodlight towers, one at each hump and the others at the ends of the various yard units, from which a total of forty-two 1,000-watt floodlights throw their rays both parallel and transverse to the tracks. The towers range in height from 90 to 120 ft. and support from three to nine 23-in. projectors.

The projectors which were furnished by the Pyle-National Company, Chicago, are unique in several details, having special uranium glass reflectors, lenses with various degrees of divergence or refraction, air-tight aluminum cases, and deflecting visors which reclaim the upward stray light and illuminate the space at the foot and immediately in front of the tower. Complete control of each battery of lights is provided at the foot of each tower where automatic time switches turn on the lights in the evening at a predetermined time, and off in the morning, without attention.

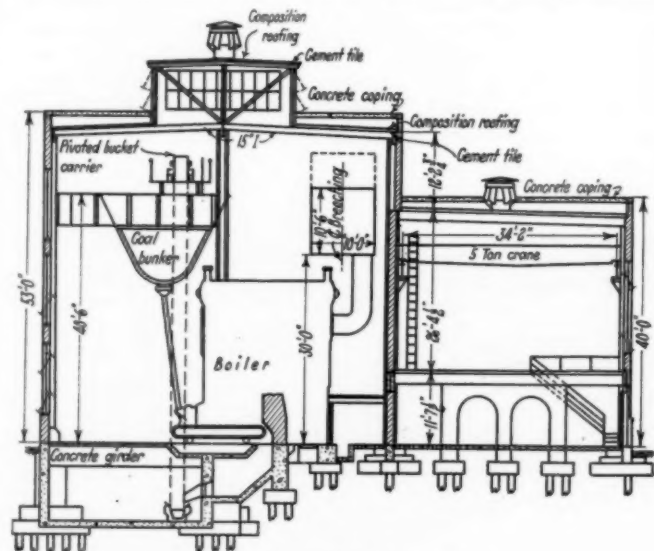
The Engine Terminal

The Engine terminal includes a 48-stall enginehouse, a locomotive repair and erecting shop, a modern power house, a combined office, store and oil building, and a miscellaneous building divided to accommodate a carpenter shop, electric shop, paint shop, pipe and tin shop and a place for handling air brake repairs. Other buildings include the engine terminal office building, the employees' welfare building, and the boiler washing house. In addition to the larger facilities mentioned, the terminal is equipped with a 1200-ton reinforced concrete coaling station and complete equipment for the drying and delivery of sand, conveniently located water columns and a two-track cinder pit.

A concrete roadway extends throughout the terminal

connecting all of the more important facilities, thus providing routes over which trucks and trailers can deliver heavy equipment and repair parts to any point. By means of floodlights installed on a steel tower at the approach to the terminal, and also on the top of the coaling station and the inner circle of the enginehouse, adequate light has been provided for safe and expeditious night operation.

The enginehouse is a 48-stall house of the monitor-top type with brick and concrete walls, timber roof and columns, and composition roofing. The floor of the enginehouse is laid with creosoted wood blocks which rest on a concrete foundation. The sash throughout the



Section Through Power House

house are of wood construction, as are also the doors, the latter being equipped with Richards-Wilcox door hardware.

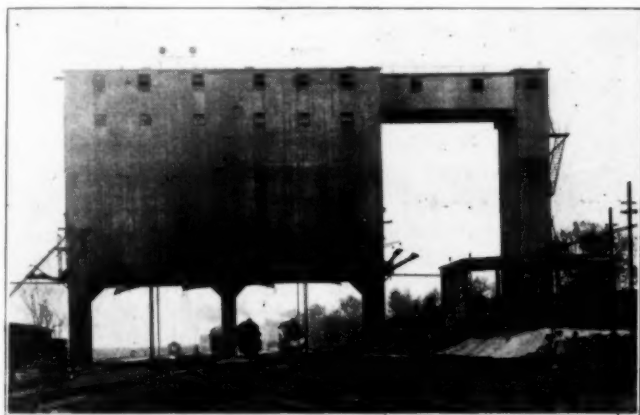
In order to prevent the spread of a possible fire in the enginehouse, the building is divided into four distinct sections by brick firewalls which extend from separate foundations through the roof. Each of these sections houses 12 stalls. In three of the sections the stalls are 100 ft. long while in the other section the stalls are 125 ft. in length and are equipped with driver, trailer and front truck drop pits for the handling of underrigging repairs.

The engine pits throughout the house are constructed of reinforced concrete and vary in depth from 2 ft. 6 in. to 3 ft. The walls of the pits are 3 ft. 3 in. thick at the top, forming the support for the track rails and a suitable jacking floor. A shallow, plank-covered pit, flush with the floor at the end of the rails at each stall, provides a safeguard against locomotives overrunning the tracks, without offering any obstruction to the engine repairmen.

Heating of the enginehouse is provided by the indirect method of hot air heating, and is accomplished through the use of steam radiators in conjunction with four Sirroco blowers, one of which serves each of the four units of the house. The individual heating units for each section are housed in four brick-walled rooms located along the outside of the outer circle wall. Receiving heat from the radiators, which are supplied with super-heated steam from the power plant, fresh air is warmed and drawn into the blowers from whence it is distributed uniformly to the engine pits and throughout the house through submerged ducts extending between every other stall with three outlets to each pit, and a similar duct, with frequently spaced outlets, extending around the outer circle.

Ventilation is provided through exhaust fans and by the use of both Paul Dickinson cast iron smoke jacks and Johns Manville Transite smoke jacks. Additional vents for the escape of air and gases are also provided in the monitor top of the roof and by a continuous shallow opening left around the house between the inner circle wall and the roof. Natural light is afforded in all parts of the enginehouse through the use of large areas of wooden sash in the roof monitor, outer circle wall and doors. Artificial lighting is secured by means of high-power electric lights suspended from the trusses, columns and the outer and inner circle walls, this being supplemented by the use of hand lights which may be plugged in at receptacles provided at the columns between stalls. Drinking fountain and toilet facilities have been installed at intervals around the house and adequate tools and equipment have been provided to afford maximum convenience to the men.

Blow-off, wash-out, refill, air and high pressure blower lines, have been installed through the house, one



The Coaling Station Serves Six Tracks

blow-off drop being placed near the center of each pit fitted with special Barco flexible joints to permit its serving the near sides of adjacent stalls; one high pressure blower drop is placed at the head end of each pit to afford artificial draft, and either two or three air line drops are provided for the operation of pneumatic tools. In addition to these connections, two wash-out drops and a refill drop are located between every two stalls, serving the two adjacent stalls in connection with the boiler washing system. The unusual features of the enginehouse piping lie principally in the unusual number of drops afforded, and in the special fittings used in the drops to provide flexibility and direct or short connections to the locomotives. All pipe lines are of genuine wrought iron pipe with welded line joints and, wherever possible, both horizontal and vertical bends have been made to large radius in order to reduce friction to a minimum.

The enginehouse is served by a 100-ft. American Bridge Company's three-point suspension type turntable which is operated by electric power.

The locomotive repair and erecting shop at Markham is adjacent and directly connected to the enginehouse and is served by the extension of three of the enginehouse tracks which will accommodate six locomotives. The building, which is of much the same type of construction as the enginehouse, is approximately 100 ft. wide by 403 ft. in length, with a central projecting bay housing the track extensions and planned as the connecting link between the present enginehouse and another which may be constructed at some future date. The floor area is divided into four sections, the north end accommodating a machine shop, the central section

the erecting shop, and the south end a blacksmith and a boiler shop.

The walls of the building are of steel skeleton brick construction and are broken up with large areas of steel sash to provide natural light. The roof is of the flat type, constructed of Continental cement tile slabs and a large number of steel frame skylights. Kreolite wood block floors have been provided throughout the building, except in the blacksmith shop where tamped cinders alone are used. The heating of the shop is effected in much the same manner as in the enginehouse, 12 Twinfan blower units being located through the center and around the outer wall of the building. These units are piped with super-heated steam from the main in the enginehouse.

The equipment in the shop building includes a 250-ton four-jack Whiting locomotive hoist located over one of the drop pits and a 15-ton Whiting overhead crane which extends the full length of the building, serving the machine bay, erecting shop and boiler shop. Tools for both the shop and enginehouse forces are kept in a tool room which is a separate unit located directly between the two main buildings at the point where they are joined.

The Power House

The power house is located immediately to the left of the entrance to the enginehouse and is constructed of steel and brick, harmonizing with the other buildings of the terminal. The building, which is approximately 122 ft. long and 93 ft. wide, is divided into two principal sections, the boiler room and a two-story section, on the second floor of which are located the pumps, compressors, electrical units, and the power receiving and distribution panels. With the exception of the first floor under the power room, which is of tamped cinders, all of the flooring in the power house is of concrete with a granitoid finish. The roof is of the monitor type, covered with cement slabs, Celotex, and composition roofing, and the monitor as well as the side walls is fitted with extensive areas of steel sash. Ventilation is provided by six 36-in. Aeolus cast iron ventilators in the monitor of the roof.

Steam is generated in the power house by two Union Iron Works horizontal water-tube boilers, each of 511 hp. and capable of a working pressure of 200 lb. The boilers are fired by automatic chain-grate stokers which were supplied by the Combustion Engineering Company. Natural draft is provided by a reinforced concrete chimney 253 ft. high, which was constructed by the John V. Boland Construction Company, St. Louis, Mo.

The handling of coal and cinders at the plant is entirely by conveying machinery installed by the Link Belt Company, Chicago. Coal is delivered in cars over a track hopper at one end of the building, where it is dumped and elevated to overhead bunkers by an endless pivoted bucket conveyor which extends in a vertical plane around the powerhouse. From the bunkers, the coal is delivered to the stoker hods by gravity through two cylindrical chutes which operate automatically across the hods, keeping them full. Cinders from the grates drop into a collecting hopper from which they are discharged onto the coal conveyor as it crosses the bottom of the plant, and are carried to a bin directly above the track hopper where they are held until discharged into a cinder car.

The Coaling Station and Cinder Pits

Coaling of locomotives at the terminals is effected by a 1,200-ton twin hopper type reinforced concrete coaling station located about 1,000 ft. from the enginehouse. This station extends over four tracks and serves six

tracks with two coaling aprons to each track. The coal received at the station in cars is dumped into either of two track hoppers from which it is elevated and carried over to the coal hoppers in a fixed bucket type of chain conveyor. The coaling station was designed by Illinois Central engineers and the elevating equipment was installed by the Link Belt Company. Sand for locomotives is delivered in cars to two wet sand bins located alongside the coaling station, from which the sand is dried in drying stoves located in a drying house between the bins, and then forced by compressed air into storage compartments located in the coaling station.

The two cinder pits installed are among the most interesting facilities at the Markham terminal. These pits are of the deep quenching type and are located midway between the coaling station and the enginehouse. Each pit is served by a pit track, these tracks being spaced 42 ft. center to center. Between these tracks there is a stub-track for the spotting and loading of cinder cars. The pits are 300 ft. long and are constructed of concrete, the interior face of the outer wall in each case being sloped inward to the main body of the pit. The outer rail of each pit track rests on the top of the outer pit wall, while the inner rail is supported on heavy I-beam girders which in turn rest on concrete pedestals set in the pit.

Cleaning of the pits is accomplished by means of a $1\frac{1}{2}$ yd. clamshell bucket suspended from a 5-ton Whiting overhead crane which travels the full length of the pits on an elevated trackway supported on each side by 12 reinforced concrete piers.

Smaller Buildings Embody Permanence in Construction and Adequate Facilities

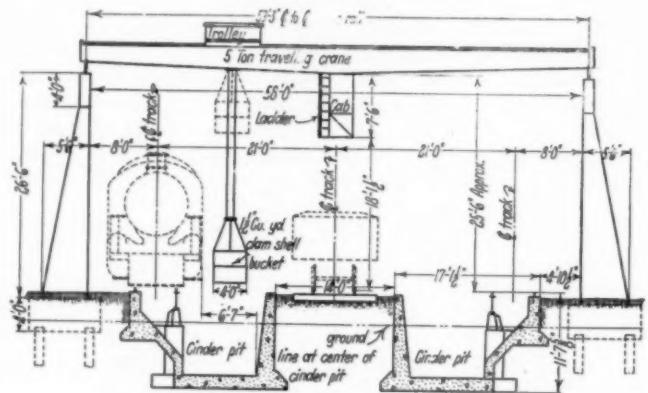
The office, store and oil building, located close to the north end of the locomotive shop, is a brick structure 171 ft. long and 40 ft. 4 in. wide. This building is divided into three units as indicated by its name, one end housing the offices of the general foreman and the storekeeper, the other end, the oil room which is approximately 29 ft. long, and the central section, the store which is about 114 ft. long. The office section, which has a second story for record files, etc., has a completely finished interior with Celotex ceilings and maple floors. The storehouse is arranged in one large room with a cement floor and is broken up with panels of steel shelving for the orderly storage of materials. The oil room, which is provided with a basement, houses all of the oil equipment and supplies, large storage tanks being located in the basement, while the main floor is equipped with oil pumps and numerous portable tanks for current requirements. A 1,000-lb. overhead crane extends around the interior of the oil room and provides means of handling heavy containers and supplies.

Parallel with this building and immediately between it and the enginehouse tracks is another brick building, 263 ft. long by 30 ft. wide, which is divided by fire walls into 5 sections of from about 40 ft. to 60 ft. in length, housing a carpenter shop, paint shop, electric shop, air brake shop and a pipe and tin shop. This building has a flat frame roof covered with composition material, large areas of steel sash and a wood block floor laid on a concrete foundation. Ventilation is provided by roof ventilators and each section of the building is heated by a unit heater.

The rest house or welfare building at the terminal is a two-story brick structure 97 ft. 4 in. long by 42 ft. 2 in. wide, providing separate quarters for the shop forces and the engine crews. The first floor is divided into two sections, one for laborers and the other for the shopmen. The second floor is devoted entirely to engine crews. Both floors are equipped with individual lockers, wash

basins, and toilets, the first floor being occupied solely by these facilities, while the second floor has in addition an enginemen's lounging and rest room and a 24-ft. by 40-ft. assembly room. This building has a flat, composition covered roof, concrete and maple floors, the latter being only in the lounging and assembly room, and plaster and Celotex walls and ceilings.

The terminal office building, in which are the offices of the roundhouse foremen, boiler foremen, and traveling



Section Through Cinder Pits

engineer, is a one-story brick structure about 51 ft. long by 26 ft. wide. In addition to the offices mentioned, space is also provided in this building for a toilet room, a file room, and an additional office. Like the other office space at the terminal, the interior of this building is well-lighted, heated, and ventilated, and is completely finished with Celotex walls and ceilings, and maple floors.

The Water Supply System

The locomotive water supply in Markham yard is secured from the south branch of the Calumet river. The water is treated with lime and soda ash in a 50,000 gal. per hour water softening plant which was installed by the Railroad Water and Coal Handling Company, Chicago. This plant is completely operated by electricity and is automatic in operation, the operation of pumps, chemical control equipment, etc., being regulated entirely by float switches located in the six storage tanks, one of which is at Harvey, one at 151st St., one at Homewood, one at the north end of the northbound classification yard, and two at the mechanical plant. All of the tanks of the water system are American Railway Engineering Association standard 100,000 gal. creosoted water tanks, with the exception of the treating tank which is a 500,000 gal. steel tank construction by the Chicago Bridge & Iron Works, Chicago.

Water is delivered from the treating plant through a 14-in. cast iron water main extending from the plant to the twin tanks at the mechanical facilities, and through smaller lines connecting up the other tanks. There are nearly 5 miles of 14-in. cast iron pipe in this system in addition to several miles of 8-in., 10-in., and 12-in. pipe. Water is delivered to locomotives through eleven 12-in. Poage water columns.

The drinking water supply at the mechanical terminal is secured from the city of Homewood whose source of supply is deep wells, while drinking water for the yard office at the north end of the yard is obtained from the city of Harvey, which, in turn, obtains its supply from deep wells supplemented by Chicago city water.

A complete fire system has been installed throughout the yard and terminal with all fire lines independent of service lines, and hydrants and hose houses have been located at strategic points. Two 1,500 gal. electrically

driven centrifugal fire pumps are provided for use in case of fire, one of which is located in the mechanical department power house and the other in the car department power house.

The entire project at Markham has been carried out under the general supervision of F. L. Thompson, chief engineer and since January, 1925, vice president of the Illinois Central, and A. F. Blaess, formerly engineer of maintenance of way and since January, 1925, chief engineer. The design of the yard has been made under the immediate supervision of W. P. Cronican, chief draftsman, and L. L. Lyford, assistant engineer, has been in charge of the construction in the field. The engine terminal facilities and other buildings have been designed and erected under the supervision of F. R. Judd, engineer of buildings.

Wheat Movement Taxes Railways

THE transportation of the wheat crop of the Southwest this year is presenting a difficult problem to the railways because of its size and its early appearance, according to a statement issued by the Western Railways' Committee on Public Relations. The unusual volume of the crop in parts of the territory and a new method of harvesting and threshing it which resulted in its being delivered to the railways with unprecedented rapidity, subjected the transportation machine in the southwest to the severest test it has had to meet in years.

The crisis has now been passed without producing any serious results, but except for recent improvements in railway equipment and operating methods and the co-operation of carrier and shipper that has been developed within recent years through the Regional Shippers' Boards, there would have been a disastrous car shortage in the Southwest. Even now the wheat movement is so large that great efforts on the part of the railways and shippers are still necessary to handle it satisfactorily.

Reports of crop conditions had indicated that the wheat crop of the Southwest would be much larger than in 1925 and in parts of the territory would exceed the big crop of 1924. There was another factor in the situation, the importance of which it was impossible to estimate in advance. There has recently come into extensive use in the Southwest a machine for harvesting wheat known as the "combine." Formerly wheat was first headed and stacked, and later threshed and moved to elevators and freight cars. With the "combine," it is simultaneously headed and threshed and immediately hauled to local stations. Developments within recent weeks have shown that with this method the grain comes to the railways earlier and in much larger volume during the harvesting season than under the older methods of harvesting and threshing.

In anticipation of a large and early wheat movement the railways serving the Southwest assembled and stored about 40,000 box cars in good condition in that territory before the beginning of harvest. This was almost twice as many cars as were held in readiness for the big harvest of 1924, when the roads had no considerable difficulty in handling the crop. Recognizing the necessity for the co-operation of all interests concerned to accomplish the best results, the Trans-Missouri-Kansas Shippers' Advisory Board established joint terminal grain committees at Kansas City, Mo.; St. Joseph; Wichita, Kan.; Hutchinson, Atchison and Salina, and the Southwest Shippers' Advisory Board established similar committees at Ft.

Worth, Texas, and Galveston. These committees are composed of representatives of the organized grain industry, and officers of the railways serve jointly with them in determining the distribution of cars, expediting their loading and unloading, etc.

The manner in which the crop was rushed to the railways is well illustrated by the experience of the Atchison, Topeka & Santa Fe, the largest carrier of wheat from that territory. Before the wheat movement started the Santa Fe had 12,500 cars stored throughout the Southwestern wheat growing territory. On June 21 and some days previously its grain car loadings were about 200 cars daily. On June 24 this had increased to 772 cars; on June 30 to 1,390 cars, and on July 1 to 1,569 cars. This movement was entirely unprecedented, the largest number of cars the Santa Fe had ever previously loaded with grain in a single day having been 962 on July 26, 1924. Its grain loadings in the last ten days of June and the first 19 days of July, 1924, had been 13,188 cars, while in the corresponding period of 1926 they were 28,153.

It was found impossible for the Santa Fe to meet the demand for cars with those available on its own lines, and it asked the Car Service Division of the American Railway Association and other individual lines for help. Both Eastern lines and Western lines outside of the Southwestern wheat belt came to the Santa Fe's assistance and between July 5 and July 20 they furnished about 5,800 cars. Of these, about 4,700 were delivered at Chicago and other Illinois junction points. Many of them came from Western railways that had nothing to gain by giving up cars, because the wheat traffic would not move over their lines.

The Santa Fe's problem was greatly complicated by the fact that it recently has opened two new lines, one running from southwestern Kansas into Oklahoma, and another in the northern part of Texas. On these lines no large elevators had been constructed and in consequence the elevator capacity for receiving the grain and loading it into cars was utterly inadequate. It was on these lines, and owing to lack of elevator capacity, that a large amount of wheat had to be piled on the ground. The Santa Fe is now able to furnish practically all the cars being ordered by the shippers.

The experience of the Chicago, Rock Island & Pacific was similar to that of the Santa Fe, except that it was not troubled with new lines lacking elevator capacity. Before the harvest began this road had 6,100 box cars stored in the Southwestern wheat belt. Between June 8 and July 17 its grain loadings amounted to 14,239 cars, as compared with 6,238 in the same period of 1924. The grain loadings reached a maximum of 1,090 in a single day, as compared with a high record in previous years of 700 cars. The cars stored before the harvest commenced rapidly melted away and the Rock Island like the Santa Fe, immediately began to collect cars from other railroads and rush them to points where the conditions were growing acute. Up to July 20 the Rock Island had moved 8,000 additional cars for grain loading into the wheat territory and had met the demand for cars so effectively that it had about 2,000 cars stored in that territory.

Among the other large carriers of wheat in the Southwest are the Missouri Pacific, the Missouri-Kansas-Texas and the St. Louis-San Francisco. These roads also had serious difficulties to overcome owing to the rush with which wheat was delivered, but the peak of the movement from the Southwest is now passed and the danger of a serious car shortage, which would have caused immense losses to the farmers, has been averted, by the strenuous efforts of the railways, supported by the co-operation of the Shippers' Regional Boards.

I. C. C. Report on W. P. and D. & R. G.

Use of Denver & Rio Grande credit to finance Western Pacific criticized

WASHINGTON, D. C.

THE financial transactions by which the credit of the Denver & Rio Grande was used to finance the building of the Western Pacific to extend the Gould chain of railroads to the Pacific coast are severely criticized, as the cause of succeeding insolvencies of those companies, in a report made public by the Interstate Commerce Commission on July 30 of its investigation, instituted five years ago, into the accounts, financial operations and practices of the Western Pacific Railway, Denver & Rio Grande Railroad, Western Pacific Railroad and Denver & Rio Grande Western Railway.

The 160-page report, by Commissioner Henry C. Hall, reviews the history of these companies, and, while it declares that the record discloses no evidence that the insolvencies were brought about for the personal profit of the officials of the companies or the bankers, says that the officials may be justly criticized for the initial action by which the D. & R. G., was "committed to an unsound speculation undertaken to provide a Pacific coast outlet for a large railroad system of which the New Denver was a minor unit." The name "New Denver" is applied in the report to the Denver & Rio Grande Railroad which was incorporated in 1908, succeeding the old company of the same name, and which has been succeeded since by the Denver & Rio Grande Western.

The proceeding was instituted by the commission "for the purpose of determining the manner and method in which the business of these companies had been or was being conducted, with a view to the making of a report and such order or orders as might be proper in connection with their accounts and practices and the issuance by them of securities." It is stated, however, that "no order is necessary or appropriate." The question of security issues has been before the commission in separate proceedings involving both the Denver & Rio Grande Western and the Western Pacific.

In several places in the report it is stated that the Denver & Rio Grande would have been able to serve the public better and would have profited had it used its own resources in the development of its own property instead of in support of the Western Pacific.

The conclusions are as follows:

The reported insolvencies and receiverships summarized in the foregoing recital are all traceable to one source, the assumption in 1905 by the Denver Companies of obligations with respect to the Western Pacific and its securities which were beyond their abilities to fulfill. The enormous losses by stockholders and bondholders and the long period of impaired railroad service followed as the natural economic results of that one ill-advised undertaking.

The Western Pacific Project

The greater part of the Western Pacific's railroad traversed a mountainous and desert country which was utterly unable to contribute any substantial amount of traffic. Ample railroad facilities already existed for traffic moving between the Pacific Coast and all territory east of the Rocky Mountains. Within recognizable limits, carrier competition makes for adequacy of service at reasonable rates. But duplication of service by reason of duplicated plant and duplicated labor costs may result to the disadvantage of carriers and shippers alike. The Western Pacific was built to complete the Gould chain of railroads across the country and place it upon a competitive basis with the systems which already reached the Pacific coast. In itself this purpose was not unworthy. The new link would assist

in developing the territory traversed, would open another through channel for commerce, and would sooner or later become necessary for free movement of that commerce. But against these public benefits, immediate or remote, must be counted the cost. Was the time ripe? In view of the then existing facilities for through traffic, far in excess of the traffic offered, was this new construction justified or likely to be justified within a reasonable lapse of time? And, if justified, who was to bear the initial costs and make good the operating deficits during the stage of adolescence? Gould solved the last question first. He bound that burden upon other roads of his system with little concern as to whether or not they could bear it without impairment of their ability to serve the public adequately over their own rails. This little concern of his is our chief concern.

The early activities of Gould and Jeffery in initiating the Western Pacific project were carried on by use of the funds and upon the credit of the Old Denver without the authority of the company's directors or stockholders. If the project was undertaken as a personal venture such misuse of company funds can not be too severely denounced, and this statement is made with full recognition that the loans obtained from and upon the credit of the Old Denver were later repaid. If the early initiation of the project was on behalf of the Old Denver, the undertaking was unauthorized and the use of company funds and credit in that undertaking was likewise unauthorized. Following the failure of efforts to market Western Pacific bonds, secured by Western Pacific resources alone, a guaranty of those bonds was obtained from the Denver Companies.

The forecast of the construction cost of the Western Pacific railroad, as submitted to the directors and stockholders of the Denver Companies when they finally authorized or ratified the commitment, was even more unreliable than is usually the case in new construction projects, but, aside from this feature, the facts connected with the obligations so assumed appear to have been fully presented. The authorization of Old Denver stockholders for the undertaking was not sought or obtained until four months after the company's directors and officials had committed the company to the guaranty, but the ratification thereof was then duly voted by stockholders. Unquestionably railroad stockholders should give close attention and study to all questions of management of policy for which their ratification is asked, but even in such matters they must, of necessity, place great reliance in the judgment of their elected officials who are in closer touch with the railroad's problems.

A majority of the Old Denver directors were likewise directors of the Missouri Pacific and the record leaves no doubt that their judgment as to the interests of the Old Denver and its subsidiary, the Western Company, was influenced by their concern as to the welfare of the Gould system, considered as a whole. It has been shown that the prosperity of the Denver Companies need not have been seriously affected by the Union Pacific control of the Ogden gateway. In fact it is reasonably certain that if one-half of the money advanced to the Western Pacific by the New Denver had been expended in properly maintaining and improving its own service, the resulting benefits would have greatly exceeded any possible benefits which it might have derived from providing the Gould railroads with their Pacific coast connection. It is true that the Denver Companies, like other railroads of the Gould system, would have been benefited by an independent outlet to the Pacific coast, but it is not clear why they alone should have been made to bear the risks of securing that outlet. It is true that if the Western Pacific operations should have proved profitable to it, the Denver Companies, as owners of five-sixths of its stock, would have enjoyed the greater part of that profit. But those profits were, to say the least, remote when considered in connection with the tremendous liability assumed and the inability of the Denver Companies to meet it.

In brief, shortly after Missouri Pacific control had been established over them the Denver Companies, theretofore profitably and conservatively managed, were committed to an unwise speculation which was intended to benefit all railroads of the Gould system, whereas its risks would be borne by the Denver Companies alone and its unsuccessful outcome would affect other railroads of the Gould system only to the extent of the 30 per cent stock interest in the Old Denver owned by the Missouri

Pacific. That such a situation could have been brought about through ownership of only 30 per cent of a railroad's stock is illustrative of the inequities which were formerly possible within a railroad system controlled through interlocking directorates. Under the present law the same individual may not be an officer or director of more than one railroad without our consent. Moreover, the railroads are now required to obtain our authority before undertaking the construction or acquisition of additional lines and before issuing securities or assuming obligations in respect of the securities of other corporations or persons. The opportunities for bringing about similar inequitable situations have been materially lessened by these new provisions of the interstate commerce act.

The Denver Company's Default

Following assumption by the Denver Companies of obligations to support the Western Pacific enterprise their resources and those of their successor, the New Denver, were rapidly depleted in fulfilling those obligations. Excessive construction costs were responsible for a considerable wasting of assets, and the large underwriting discounts and commissions demanded by the bankers from the New Denver in its time of need accounted in a minor degree for the exhaustion of its resources. But apart from these contributing factors the obligations assumed would still have been larger than the New Denver could meet while maintaining the efficiency of its own service and properly safeguarding the interests of its security holders. In March, 1915, the New Denver defaulted upon its obligations under contract B. Unquestionably it could have continued to meet those obligations for a longer period. Unquestionably its decision to default was influenced by the hope that it might thereby precipitate and bring about a favorable readjustment of its contract obligations, or, in the event of a failure to effect a satisfactory settlement thereof, that it might evade its full contract obligations through a court construction of certain technical features of the contract. If the New Denver had been successful in these efforts to scale down its obligations it could have deferred its actual insolvency for many years, but it was already so crippled financially that a reorganization of its capital structure would have been necessary in any event in order to induce the investment of the many millions of new money needed to fit the properties for the rendering of efficient service.

The record discloses no evidence that the insolvencies of the Western Pacific and New Denver were brought about for the personal profit of the officials of those companies or of the bankers. Such co-operation as was given to the trustee by the New Denver in the California proceedings for the foreclosure of the Western Pacific mortgage was obviously induced by its desire to avoid adjudication of its own contract obligations in that suit. Furthermore the prior foreclosure of Western Pacific properties was necessary to and a part of the defense that was to be offered in the New York suit in avoidance of the New Denver's contract obligations. This investigation has not disclosed any ground which the New Denver could have pleaded with any probability of success in avoidance of its contract obligations other than those urged by its counsel in the New York damage suit.

The essential facts developed by the investigation may be summarized as follows: The New Denver, successor to the Denver Companies, was committed by its officials to an undertaking beyond its financial strength; the resulting demands over a period of years exhausted its financial and physical vitality; facing insolvency, it made determined and prolonged, but unsuccessful, attempts through negotiations with its creditors and in court proceedings to evade the obligations to which it had been committed. In so far as we are concerned with the efforts of New Denver officials to relieve their company of its contract obligations, it may be definitely stated that those efforts were clearly directed toward the protection of the interests of the company's security holders. In fact, the only moral justification for the various means used by these officials in their attempt to free the company from its obligations is that, in the positions of trust occupied by them with relation to such security holders, they deemed it their duty to use all means available to avert the company's impending disaster.

The initial action by which the New Denver was committed to an unsound speculation, undertaken to provide a Pacific coast outlet for a large railroad system of which the New Denver was a minor unit, is the action for which the company's officials may be justly criticized. That commitment caused the diversion to the support of another railroad of many millions of dollars which normally would have been used for the improvement of the New Denver's own service and for the maintenance of a sound financial position. Deprived of an efficient and modern railroad service, the agricultural and industrial growth of the country tributary to New Denver lines was retarded, and entire

communities were thereby subjected to heavy losses. Finally the obligations under that commitment brought about the New Denver's insolvency and the resulting enormous losses to its security holders.

Security Holders Chief Sufferers

Without intending in any way to minimize the losses to the communities served by the New Denver caused by the inadequate service furnished them, it must be emphasized that the chief sufferers from the speculative undertaking to which the New Denver was committed are its security holders. Each step taken by the trustee to enforce the rights of Western Pacific first-mortgage bondholders, whether taken against the Western Pacific, whose stock was chiefly owned by the New Denver, or taken directly against the New Denver, tended to deplete the assets of the New Denver. Holders of New Denver adjustment bonds and refunding bonds, respectively, have been compelled either to accept heavy immediate losses on their investments or to participate in a reorganization entailing substantial sacrifice of lien priorities. Holders of New Denver stock are holders of worthless paper. There are outstanding \$49,775,670, par value, of preferred shares and \$38,000,000, par value, of common shares, of New Denver capital stock. These shares are widely distributed. By reason of the uninterrupted payment of dividends on the preferred stock for many years prior to 1911 that stock had acquired investment standing and as a result is owned in small lots by individuals scattered throughout this country and in Europe. To such holders their investments in these shares may represent the savings of years put aside to safeguard their families against the consequences of illness or death. To them the loss of such investments spells tragedy. Letters in our files bear witness to the fact that many such tragedies have followed in the wake of the New Denver's insolvency. That insolvency is not shown to have been brought about for the personal profit of New Denver officials, but the responsibility for the ill-advised commitment of the New Denver from which it resulted is none the less theirs.

The fact that these disastrous happenings are directly attributable to a single inequitable and economically wrong commitment forcefully illustrates the need which existed for the above mentioned new provisions of the interstate commerce act directed to the curtailment of opportunities for the making of such wasteful commitments.

No order is necessary or appropriate.

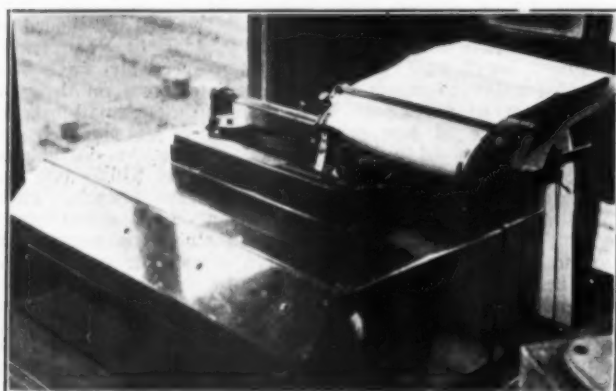
Telegraph Printers in Hump Yard Service

WHAT is said to be the first installation of printing telegraph equipment in a hump classification yard is that completed recently at the Gibson, Ind., yard of the Indiana Harbor Belt. These printers provide the yard-master and various car retarder operators in the yard with the switching lists showing the destination of cars in a train being humped. They provide a communication service which is faster and more satisfactory than the messenger service previously employed for this purpose. This advantage in time is an important one for this class of service due to the fact that it is necessary to have switching and car loading information in all of the towers within a very short period of time after an incoming train arrives in the yards. The printing telegraph supplies this need in a humpyard equipped with car retarders as it permits full advantage to be taken of the more rapid switching of cars in the yard, made possible by the installation of power operated retarder units.

The machines installed are Teletype printers, manufactured by the Morkrum Kleinschmidt Corporation, Chicago, and comprise a transmitting machine in the yard freight office, with receiving machines in the yard-master's office at the top of the hump, in the junction tower about 150 ft. below the top of the hump, and in each of the retarder towers.

With the new installation, as a train pulls into the yard the conductor sends his waybills to the yard freight

office through a pneumatic tube, and by the time the road engine is detached from the train, the pusher engine connected at the rear and the train pushed up to the hump, all of the towers have received copies of the switching list for that particular train, thus allowing cars to be sent over the hump immediately. This represents an appreciable saving of time over the old system under which it was necessary for a typist in the yard freight office to prepare multiple copies of the train lists on a typewriter and a messenger to distribute

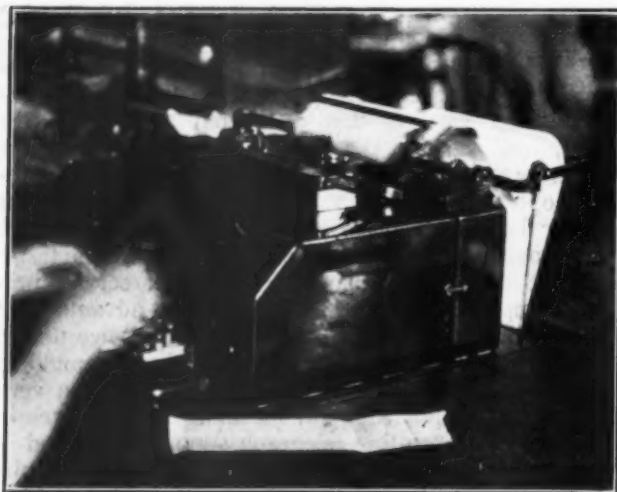


A Receiving Machine Is Installed in Each of the Retarder Towers

them to each of the towers in the yard. As the latter are located at considerable distances from each other this process was considerably slower than that now employed. Another consideration is the elimination of risk to human life resulting from the replacement of yard messengers.

Scheme of Operation

When a freight train pulls into the yard the conductor alights from the caboose and sends all of his waybills



The Transmitting Machine in the Yard Freight Office

for the train to the local freight office by means of a pneumatic tube. In the freight office the cars are classified as to destination and loading. This information is then handed to the operator of the transmitting Teletype who telegraphs a description of the train in the form shown in one of the illustrations. This shows the arrival track in the receiving yard, the railroad from which the train was received, the engine number, the conductor's name and the time and date of arrival. This is followed

by a list including each car in the order in which it appears in the train, the first car on the list being the first car to go over the hump. Following the number designating the order of the car in the train, the operator types the car number, followed by one of five symbols designating the car loading. These symbols are "E" for empty, "LL" up to 40,000 lb. net, "L" between 40,000 and 100,000 lb., "XL" between 100,000 and 115,000 lb., and "XXL" above 115,000 lb. The last column gives the destination of the car and enables the retarder operator to place the car or cars on the proper track. This information is reproduced simultaneously on the receiving machines at the yard-master's office and at all of the retarder towers.

In the Yard Office

At the yard-master's office which, as previously stated, is at the top of the hump, this information is used for cutting off the cars. As the train is pushed over the hump the cars are cut off singly or in groups of two

| | | | |
|---|-------|-------|---------|
| 6 | WEST | PA | 9254 |
| | NOLAN | 120 P | 5/11/26 |
| 1 | 21691 | E | CA |
| 2 | 16460 | L | SFE ELS |
| 3 | 19911 | L | CNW |
| 4 | 15279 | E | CNW |

| | | | |
|------------------------|-------|---|---------|
| 22 | 94949 | L | STP |
| 23 | 30008 | L | CBQ |
| 24 | 21887 | E | SFE ELS |
| CHECK AT 125 PM | | | |
| COMPLETED AT 201PM AMB | | | |

Portion of a Typical Switching List at Gibson Yard

or more, according to whether successive cars are destined for different tracks or the same track. In each tower the operator tears off the sheet from the Teletype printer and hangs it up on the wall, thereby having before him a list giving the description of the train together with the necessary information about each car, all arranged in the order in which the individual cars go over the hump. Information on car loading is essential to the proper operation of the retarder units as the amount of retardation depends almost directly upon the weight of the car and load.

While this system provides the individual car numbers, it is seldom necessary for the retarder operator to take the time to identify the number on a car as it passes his tower for the cars all go down the hump in the order listed on the sheet, all that it is necessary for him to do being to check off each car as it passes, which shows him at a glance what the next car will be.

Transmission of Power on Oil Engine Locomotives*

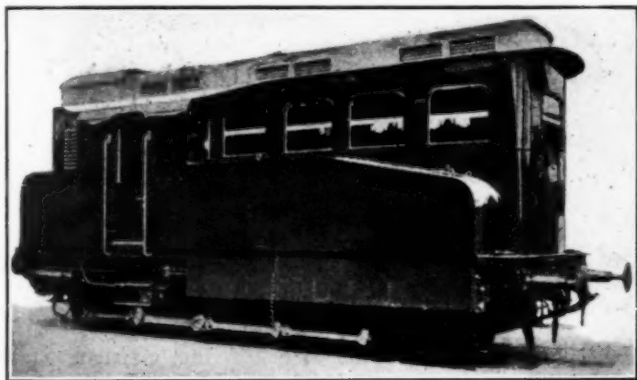
Status of electric, hydraulic, pneumatic, steam, aero-steam and exhaust gas transmissions

By Alphonse I. Lipetz

Consulting Engineer, American Locomotive Company, Schenectady, N. Y.

CONSIDERING the fact that the Diesel engine is the most economical prime mover of our present age, and that, on the other hand, the reciprocating non-condensing steam engine of the present-day locomotive is far from approaching the efficiency of the latter, one cannot help but wonder why it is that the Diesel locomotive has not yet come into being, although almost 30 years have already elapsed since the first marketable Diesel engine was built.

There are several reasons to account for this fact, but, briefly, all of them can be reduced to one; namely, that the steam engine is a very flexible machine, making the



400-h.p. Diesel Locomotive Equipped with the Lentz Hydraulic Transmission

steam locomotive a wonderfully adaptable and convenient means for railroad traction, whereas the Diesel engine is the most inflexible prime mover. As is well known, the Diesel engine is a constant-torque prime mover and the torque cannot be appreciably increased; neither can the engine start under load. This either makes direct coupling of driving wheels with the engine brake shaft impossible, or requires special devices in order to overcome the above-mentioned handicaps of the Diesel engine. It is to these devices that the tardiness of the development of the Diesel locomotive must be attributed.

There are several sides to the problem of the Diesel locomotive; the Diesel engine, or broadly speaking, the oil engine, is one question; the torque-varying devices, or the transmission of power from the oil engine to the driving wheels, is a second; and the cooling of the oil engines on the locomotive is a third.

Power Transmission

Owing to the inflexibility of the Diesel engine, the most natural thing to do is to use some sort of flexible power transmission in which a new intermediate energy

is generated (electricity, hydraulic pressure, etc.) and immediately expended, thus permitting a variation of torque and speed at will. Such a system requires in addition to the full-power oil engine two more full-power machines—a generator, pump, or compressor, as the case may be, and a corresponding electric, hydraulic, or pneumatic motor. Assuming that a direct transmission of power by mechanical means is not possible, the full-energy power transmission seems to be the only feasible solution. However, in speaking of the inflexibility of the oil engine, we must not forget that the latter is not absolutely, but only relatively, inflexible, and that it can be regulated within certain limits—about 15 per cent above normal and about 75 per cent below normal. Consequently there would be a certain range within which a direct mechanical transmission of power would seem possible. Therefore there is a certain class of power transmissions in which the power is transmitted partly mechanically and partly through an auxiliary medium (electricity, oil, etc.); these transmissions have the advantage of using smaller auxiliary generators and motors and of giving higher efficiencies within the range where the mechanical transmission of power is mostly used.

Further, attempts have been made to make the oil engine more flexible in order to permit the use of direct mechanical transmissions. While such attempts have not yet passed the stage of preliminary trials, nevertheless they merit serious consideration as they may lead to the most desirable and most promising solution.

Thus we have three classes of power transmissions for oil-engine locomotives; full-power elastic-fluid transmissions, differential elastic-fluid transmissions and mechanical and direct transmissions.

Full-power Elastic-fluid Transmissions—

Electric Transmission

The electric transmission is, of course, the most orthodox, the most thoroughly studied, the best worked out in all details, and the readiest to use. The idea is not new, as all component parts have been known for a long time and have proved separately their reliability during many years of service.

(Here Mr. Lipetz has described the development of the Diesel-electric locomotive beginning with a design worked out by the Koloma Works, Russia, in 1909, and ending with a description of the locomotives being built jointly by the General Electric, American Locomotive and Ingersoll-Rand Companies. Complete descriptions of the outstanding developments referred to by the author have been published in past issues of the *Railway Age*—Editor.)

The author would like to state that while American manufacturers were somewhat slow in taking up the problem of oil-engine locomotives, having left its devel-

* Abstract of a paper presented at the spring meeting, San Francisco, Cal., June 28 to July 1, 1926, of the American Society of Mechanical Engineers.

opment to the initiative and skill of European engineers, they have nevertheless made considerable progress since starting. True, enough, they concentrated their entire attention on practically one type—with electric transmission, but they have already overtaken their European comrades.

Hydraulic Transmission

When the Diesel locomotive built in Germany in 1913 with the engine directly connected to the driving wheels failed to perform the required work, the German Railway Administration was looking for some sort of a flexible transmission of power. The author does not know why electric transmission was not resorted to, but it happened at the time that Hugo Lentz had just brought out a design of hydraulic transmission and the German Railway Administration decided to try it out. Accordingly a small 30-hp. Diesel locomotive with Lentz transmission was built, the tests were considered encouraging, and several more locomotives were ordered for experimental purposes.

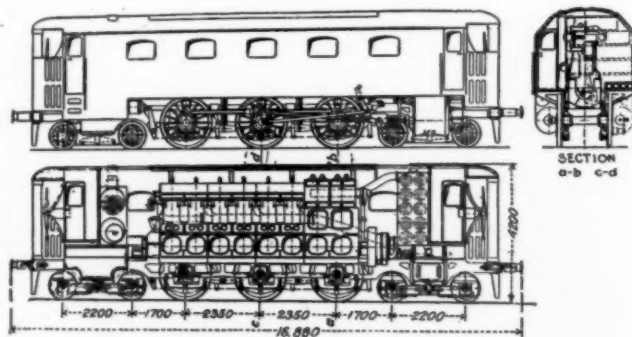
The 30-hp. Diesel-Lentz locomotive is a small 0-4-0 switching engine. It was built in 1921 by the firm A. Gmeinder & Co., Mosbach, Germany, which was reorganized later into the Badische Motor-Lokomotiv-Werke A.G. The locomotive consists of a three-cylinder, four-cycle Diesel engine built by Benz, with a Lentz hydraulic gear connected by means of coupling rods with two driving axles, and with a water cooler in front of the locomotive similar to coolers of the automobile type. The Benz engine is a three-cylinder Diesel engine simplified for application to locomotives and adapted to the use of heavy oils. It runs at a maximum speed of 500 r.p.m. and is provided with a flywheel and a governor. The engine shaft is located parallel to the longitudinal axis of the locomotive. The locomotive weighs 12.12 tons and has a tractive force of 5,280 lb. The engine can run at three different speeds—2.5, 5.0 and 7.5 m.p.h., and pulls on a level a train of 132 tons.

The results obtained with the 30-hp. Diesel-Lentz locomotive appeared to be so satisfactory that many builders in Germany and Austria began the construction of larger locomotives. In 1923 the Grazer Maschinenfabrik of Graz, Austria, built a 60-hp. 0-4-0 locomotive. In this a 6-cylinder, 4-cycle, air-injection Diesel engine running at speeds of from 250 to 350 r.p.m. and developing 60 hp. at 300 r.p.m. drives the pump of a Lentz gear of the same design as that used on the Benz locomotive. The locomotive develops a tractive force of 4,850 lb. and weighs about 22 tons. The gear provides for three speeds in either direction; namely, 3.1, 6.2 and 9.3 m.p.h. Official tests were made in Austria on March 26, 27 and 28, 1924. The members of the trial committee, consisting of Dr. K. Kobes and Dr. F. Magg, both professors of Austrian technical colleges and several representatives of the Austrian State Railways, were very enthusiastic in their statements. They lauded the locomotive as a very simple engine, not less reliable than a steam locomotive, and with wonderful maneuvering and running qualities. On account of the running of all parts of the gear in oil they believed that there would be but little wear. They attached to their report an estimate of the efficiency of the gear, which they put at 82.6 per cent. They obtained this result, however, in a roundabout way, which makes this high figure very questionable. The fuel consumption and the overall thermal efficiency show, however, a saving in fuel of about 60 per cent in train service. In switching service it will be even more, due to the absence of the standby losses that take place in the case of a steam locomotive.

The locomotive in question was later taken to Eng-

land, and in 1924 was tested on the London & North Eastern. It was first assigned to switching work and it was found that the fuel cost was 0.14 cents per ton-mile with fuel oil at 8½ pence per gallon. Later it underwent elaborate road tests with trains of 103 tons car weight over a distance of 105 miles. The tests were very severe, the Diesel engine running at its maximum speed (350 r.p.m.). The average train speed was 13.55 m.p.h. and during a descent on a one per cent gradient, a speed of 25 m.p.h. was attained, the locomotive being allowed to coast with the Lentz gear put into the neutral position. The cost of fuel per train ton-mile (0.00217 gal.) was found to be 0.037 cents. The performance of the locomotive was quite satisfactory in every respect. The highest rise in oil temperature was 36 deg. F., the maximum temperature being 108 deg. F. It was found, however, that the locomotive was slow in starting and speeding up, and that in this respect improvements were needed.

At the same time the German firm that built the first 30-hp. Lentz locomotive, jointly with the Maschinenbau-Gesellschaft Karlsruhe, of Karlsruhe, Germany, developed a 160-hp. Diesel-Lentz locomotive and built three



1200-hp. Diesel Locomotive with Air Transmission (Dimensions Shown Are in the Metric System)

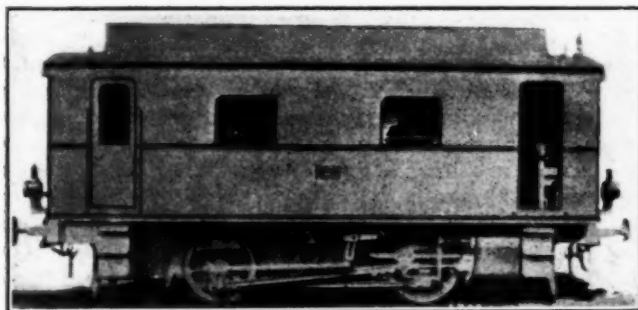
0-4-0 locomotives of this size for the German State Railways. These were provided with a cooler for cooling the oil used in the gear, which was found necessary for Lentz gears of higher power. These locomotives have been in service on the German State Railways since the early part of 1925.

The Linke-Hofmann-Lauchhammer Werke A.G., a firm in Breslau, Germany, has been very active in the developing of Diesel locomotives with Lentz transmission. In 1922 this firm built a 120-hp. Diesel-Lentz 0-6-0 locomotive for its own experimental purposes. Since October, 1922, the locomotive has been doing switching work in the yards of the company. The prime mover is a three-cylinder, four-cycle, air-blast Diesel engine of conventional design that develops 120 brake horsepower at 400 r.p.m. The Lentz transmission is of the same design as described above and provides for three speeds in either direction: 2.5, 5.0 and 7.5 m.p.h. Tests made between August 1 and 3, 1922, with the Lentz gear at the company's works in Breslau showed an efficiency of about 80 per cent (average 78.1 per cent) at the third speed (72 r.p.m. on the secondary shaft) and four-fifths of full power. At a lower output (about one-third of full power) the efficiency dropped to 65 per cent (the same third speed, but smaller torque). At the second speed (48 r.p.m.) and one-third output, the efficiency rose to 78 per cent. On account of the inadequacy of the Prony-brake arrangement, higher outputs could not be materialized at this speed, and no measurements were possible at the first speed (24 r.p.m.) Never-

theless, the general trend of the efficiency curves at the second and third speeds, led the company to assert that the efficiencies at high torques and low speeds will undoubtedly be much higher than 80 per cent, probably 85 to 90 per cent. To the author's knowledge, however, this has never been proved. In addition to the water cooler placed on the roof, an oil cooler has been provided; further tests, though, did not show that the latter was really needed. The engine in working order weighs 32 tons and can pull 440 tons on a level yard track—about one and one-half per cent grade—and 22 tons on a 7 per cent grade at the first speed (2.5 m.p.h.). On December 13, 1922, on an official test made with a train weighing 94 tons (weight of locomotive not included) over a stretch of 22 miles consisting of 0.5 and 1.0 per cent grades with an average speed of 7.5 m.p.h. (not counting stops), the oil consumption amounted to 2.3 lb. per 100 ton-miles.

The Linke-Hofmann Company must have been very much pleased with the performance of the locomotive, because almost immediately after placing the 120-hp. locomotive in service it started building an 0-8-0 type 400-hp. Diesel-Lentz locomotive.

The Motorenfabrik Deutz, an oil-engine firm of Cologne, Germany, built jointly with Henschel & Sohn,



Diesel Locomotive with Exhaust Gas Transmission

Kassel, Germany, an 0-6-0 Diesel locomotive with Lentz gear. The prime mover is a vertical 300-hp. Diesel-engine of the "Deutz" design with airless injection, able to stand an overload to 400 b.hp. The total weight of the locomotive in working order is 43.5 tons, and the maximum tractive force, 15,760 lb. It was exhibited in 1924 at the Exposition at Seddin, Germany, but very little is known of its design and nothing of its performance.

At the time when the Lentz transmission was being developed in Germany, an 0-4-0, 150-hp. switching locomotive was built in Canada with the Universal Engineering Corporation in Montreal. This transmission is also known as the Williams-Janney or Waterbury gear. The locomotive exerted a tractive force of 12,000 lb. at starting and 3,000 lb. at 12.5 m.p.h. The gear permits an infinite change of speed from zero to maximum. The locomotive weighs 26.5 tons, this mostly on account of the prime mover being a gasoline engine of the six-cylinder Ricardo type. Tests made at the Montreal plant of the Canadian Car and Foundry Company showed that 645 tons could be readily hauled on level track. On one trial the locomotive took three cars weighing 150 tons up a four per cent grade, stopping at the steepest point and starting again under full load without difficulty. This means that the locomotive developed a rail tractive force of at least 15,200 lb. The efficiency of this type is claimed to range between 68 per cent at a quarter normal speed to 82 per cent at full speed.

The Universal Engineering Corporation has applied the variable-speed gear to a passenger rail car which has been in service on the N. Y., N. H. & H. for the last two years.

A similar locomotive with a 75-hp. Diesel engine and Williams-Janney transmission was built some years ago by Vickers in England, and has been since in continuous service doing switching work in the Vickers plant at Barrow-in-Furness. It has an 0-8-0 wheel arrangement and two hydraulic motors acting on two jackshafts placed at the front and rear ends of the locomotive. The jackshafts are coupled to the drivers by means of connecting rods. No duplicates, however, have ever been built.

At the exhibition in Seddin, Germany, in 1924, the Berliner Maschinenbau A.G. of Berlin, exhibited an 0-4-0 Diesel locomotive with an oil transmission of a new design known as the Huwiler gear. This gear consists of a hydraulic pump and motor, both of the vane type, similar to the Lentz gear but differing from it in that the pump delivers an infinitely variable quantity of oil to the motor, thus permitting an infinite variation in speed. The pump and motor are built in two separate units connected by pipes, but they can be built in one unit with axes at 90 deg. similar to the Lentz arrangement.

The prime mover is a six-cylinder air-injection Diesel engine developing 200 hp. at 440 r.p.m. The cooler, provided with a fan, is located on the roof of the car. The locomotive was completed just before the opening of the exhibition. Since its close in October, 1924, the locomotive has been undergoing tests, the results of which have not yet been given out.

In addition to the above-mentioned types, there are several other hydraulic transmissions, such as the Hele-Shaw gear, the Naeder drive, and the Lauff-Thoma transmission, which have been tried with some success on small gasoline or kerosene locomotives, rail cars, and automobiles. Primarily designed for slow and occasional work, such as ship steering, rotation of gun turrets on ships, and operating machine tools, they were later proposed for light traction work but with much less success. The Hele-Shaw gear seems to have been favored more than the others, and in 1913, it was applied to a rail car built in England for Canada and later to several small switching locomotives built in France. The transmission proved to be very flexible, and the control and maneuvering very easy and simple, but no further progress was made in its application to locomotives. The efficiency was reported to be in the neighborhood of 75 per cent, but detailed figures are not available.

The difficulty with hydraulic transmission seems to lie in the low efficiency resulting from the heating of the oil, which, once started, has a tendency to increase its temperature very rapidly. It seems that the presence of air in the oil affects very materially this rise in temperature, and that some transmissions are more likely to absorb air when running than others. Lentz, for instance, claims that he has entirely overcome this difficulty. This may be due to the low pressures which he employs—about 50 to 150 lb. per sq. in. at full speed and 400 to 500 lb. per sq. in. at starting, while others use pressures of from 400 to 600 and 1,200 to 1,500 lb. per sq. in., respectively.

Pneumatic Transmission

The idea of pneumatic transmission is probably one of the first types which occurred to those interested in Diesel-locomotive design. As far back as 1909, V. A. Stuckenberg, general manager of the Tashkent Railroad

in Russia, suggested rebuilding steam locomotives in the following way: to replace the tender by a unit carrying a Diesel engine and compressor, to use the boiler as a compressed-air storage tank and to let the air work in the existing locomotive cylinders in the same way as steam. The project was not considered at that time practicable, and the idea was abandoned. About the same time James Dunlop, of Glasgow, Scotland, came out with a similar proposition and a design of a 1,000-hp. locomotive was worked out and published. However, air transmission as suggested by Mr. Stuckenberg and Mr. Dunlop could hardly offer promising results on account of the low efficiency of air motors and of the cooling of the air during expansion, which later would result in lubrication and other difficulties. Schelest, in his book on Diesel locomotives, calculated that the overall efficiency of a Diesel locomotive with air transmission would range between 13.4 and 15.3 per cent. While this is almost twice the efficiency of a steam locomotive, the high first cost of such a locomotive, probably from 3 to 3.5 times that of a steam locomotive, would render the proposition impracticable, and explains why the building of a Diesel locomotive with ordinary air transmission was never seriously attempted.

Nevertheless the Maschinenfabrik Esslingen, the German locomotive firm that built the 1,000-hp. Diesel-electric locomotive for Russia, is now building a 1,200-hp. locomotive with air transmission. The system differs, however, from the one mentioned above in that the compressed air is heated on its way to the locomotive cylinders by the exhaust gases of the oil engine. Dr. Geiger, one of the leading engineers of the Maschinenfabrik Augsburg-Nürnberg (M.A.N.) in Augsburg, who in 1918 suggested this improvement over the Stuckenberg-Dunlop scheme, estimates that 58.5 per cent of the heat contained in the oil-engine exhaust gases, which otherwise would be lost, can be recovered in the heated compressed air.

The idea of preheating air in locomotives is not quite new. It was suggested by Borsig of Berlin for two-stage compressed-air locomotives, and the H. K. Porter Company, of Pittsburgh, Pa., devised a very ingenious scheme for utilizing the heat in the atmosphere for heating air cooled during the first-stage expansion.

Steam Transmission

Instead of air, steam working in a closed circuit was suggested several years ago by Cristiana, of Milan, Italy. In his design, steam from a high-pressure container is superheated by the exhaust gases of a Diesel engine and expanded in ordinary steam cylinders; it is then expelled at 25 to 30 lb. per sq. in. into a low-pressure receiver which is cooled by atmospheric air driven by a fan. A steam compressor then draws the cooled steam from the receiver, compresses it to approximately 180 lb. per sq. in. and rejects it to the high-pressure container, after which it is again superheated, expanded, etc. The steam compressor is directly driven by a Diesel engine, and the total output of the latter is transformed into compressed-steam energy which is utilized in the locomotive's steam cylinders. The steam needed for the process is first obtained from a small boiler, which later serves to replenish the amount lost through leakage, condensation, etc.

Cristiani, however, does not anticipate any condensation, as he thinks that the steam will always be superheated. He estimates the efficiency of the transmission to be 70 per cent, giving a total overall efficiency of 23 per cent for the Diesel locomotive. He thinks that the design of the steam-transmission parts (compressor, superheater, etc.) is simpler and the construction of these

parts cheaper than is the case with any other form of transmission.

In 1923 Cristiani started the construction of a 900-hp. locomotive for the Northern Railway of Milan. The locomotive is of the 0-8-0 type and is driven by two six-cylinder 450-hp. two-cycle Diesel engines at 500 r.p.m. There are two steam compressors driven separately by each of the two Diesel engines. No information as to the progress of the work is available.

Aero-steam Transmission

The expansion of air in working cylinders is usually accompanied by a rapid drop in temperature. This was the stumbling block in the way of the first air-transmission projects. An Italian engineer, Fausto Zarlatti, thought that he might be able to overcome this difficulty by mixing the air with steam and thus keep the air warm during expansion due to the smaller fluctuation in temperature of the expanding steam. He suggested, therefore, an aero-steam transmission and even went so far as to rebuild a small six-wheel locomotive which he received from the Northern Railway of Rome.

A six-cylinder gasoline engine of approximately 70 hp. drove an Ingersoll-Rand air compressor. The engine and compressor were mounted on the tender, and compressed air was stored in the old locomotive boiler partly filled with water. The air preheated by compression before entering the working cylinders, must have passed through the column of water in the boiler and thus been saturated with vapor. In addition, use was made of the heat contained in the exhaust gases of the gasoline engine. These gases passed through the boiler and generated a certain amount of steam. The mixture of air and steam was admitted to the cylinders by means of the existing throttle and reverse lever. The locomotive with its tender thus reconstructed weighed 42 tons.

James Dunlop, of Glasgow, who back in 1909 proposed to employ air transmission, has come out lately with a new design of a main-line 1,100-hp. locomotive with an aero-steam transmission. The idea is the same as that embodied in the Zarlatti locomotive, but the design is worked out on sound lines and is of great interest. The prime mover is a six-cylinder, two-cycle, airless-injection oil engine of special design with air-compressing cylinders placed on the top of working cylinders of an annular shape. Steam at 200 lb. pressure, generated in a boiler heated by the exhaust gases of the oil-engine cylinders, is superheated by the compressed air, with which it mixes. This is supposed to result from the fact that compressed air at 200 lb. pressure is over 200 deg. F. higher in temperature than steam at 200 lb. pressure. The water space of the boiler is connected with the water-cooling jackets of the oil engine.

This system, as compared with the heated-air transmission, has this advantage that the heat contained in the oil-engine exhaust gases is transmitted to a better absorbing medium; namely, water and steam, than compressed air already heated by compression, and that the excess heat contained in compressed air is utilized for superheating steam by the direct mixing of air and steam. Dunlop further makes the assertion that "hot compressed air entering the traction cylinders along with the steam prevents initial condensation, and also prevents contact of the steam particles, so that they do not coalesce as the temperature in the cylinders falls during expansion, with the result that the steam in the mixture is about 40 per cent more effective than it would be if no air were mixed with it."

Dunlop bases his calculation of the apparent transmission efficiency on the assumption of 40 per cent im-

provement, and obtains 102.47 per cent, a figure which is not impossible. Nevertheless, this would mean a gain of 46.5 per cent over the 70 per cent ordinary air-transmission efficiency, whereas the Still oil engine, which also makes use of the heat contained in the exhaust gases and cooling water, shows an improvement of only 16 per cent. Assuming that the aero-steam transmission would probably give the same gain, one may expect to get an efficiency of 81 per cent.

Exhaust-gas Transmission

With compressed-air transmission there is always danger of lubricating-oil ignition, and special precautions must be taken to avoid this. In order to eliminate the slightest possibility of an oil explosion, it was suggested that an inert gas be used instead of air. In the case of an oil-engine locomotive the most convenient gas to use would be the exhaust of the engine itself.

Several years ago the Waggon und Maschinenbau A.G. Gorlitz, of Gorlitz, Germany, patented a system of transmission for oil-engine locomotives by which the oil-engine exhaust gases are compressed and expanded in ordinary locomotive cylinders. The same firm, jointly with Berliner Maschinenbau A.G., vormals L. Schwartzkopff, of Berlin, Germany, actually built an 0-4-0 locomotive embodying this principle which was shown in 1924 at the exhibition in Seddin. The prime mover of the locomotive which drives the exhaust-gas compressor is a 220-hp. Diesel engine running at 500 r.p.m. The exhaust gases of the engine are first cooled, then compressed to about 115-140 lb. per sq. in., and cooled at the same time, and only afterward, when the cooling is finished, are the compressed gases heated to approximately 660 deg. F. by the exhaust gases on their way to the cooler. The object of cooling the gases before and during the compression is to keep the size of the compressor and the power absorbed by compression as low as possible.

The overall thermal efficiency of the engine is claimed to be 24 per cent, but whether the engine has ever been run and tested and what results were obtained, if any, is not known.

Executives Differ as to Labor Act Prospects

THAT there is still some difference of opinion among railroad executives as to the results to be expected under the new railway labor act, has been shown in a survey made by G. M. P. Murphy & Co., New York. While a majority of the executives are hopeful that improved relations between the carriers and their men will develop, some feel that the act lacks compulsory features and is a substitute of tawdry etiquette for strength and definiteness. Some believe that the law safeguards public interest while others do not.

Daniel Willard, president of the Baltimore & Ohio expressed his opinion as follows: "I was one of that number of railroad executives who favored the passage of the Act in its present form. No one claims for the law that it will under any and all circumstances prevent strikes upon the railroads, but it does in my opinion go as far in that direction as anything that has been suggested of a practicable nature up to this time. What the law does is to outline and in fact prescribe certain methods of procedure which have been tried and found helpful in the past. That act, in my opinion, provides a way

in which industrial disputes upon the railroads might, and I believe, will be prevented."

F. D. Underwood, president of the Erie, said: "Compensating railway employees on a uniform basis is unfair to them and to railway companies. Primarily wages should be based somewhat on living conditions and conditions surrounding the service, and inasmuch as they differ so widely in different parts of the United States a uniform wage scale is unjust. A fair way to settle differences between railroad companies and their employees is through a board of arbitrators chosen from the ranks of the public in the community where the dispute occurs. Railways should be left free to deal with their employees at all times without reference to any tribunal, and in case of failure to agree both sides should be required by law to submit their differences to a board of arbitrators to be then and there chosen from the ranks of the public and their award to be binding on both parties. The side favored by the award pays the fee and when the award affects both sides the fee is divided, a simple process which would be expressed in a statute of perhaps 200 words. It would work and the present labor boards, national boards, regional boards, etc. with their attendant paraphernalia and appalling expense would sink, a consummation most devoutly to be wished."

C. H. Markham, president of the Illinois Central stated that: "The principal and only important objection that has come to my notice is the allegation that the act does not adequately safeguard the public interest."

"It is my opinion that the public interest is better safeguarded in this act than ever before. This safeguard consists first, in the spirit of agreement and conciliation out of which the act has developed; second, in the moral obligation which both parties assume in advocating a measure which they have proposed and to which they have agreed; third, in the ample machinery for handling disputes and controversies that may arise; and fourth, in the provision for public representation on the Board of Mediation, on the boards of arbitration and on the emergency board which the president is authorized to appoint whenever the managements and the employees fail otherwise to reach an agreement. The last-named board, to be appointed for each controversy which threatens to interrupt transportation, stands as a bulwark in the protection of the public interest."

W. W. Atterbury, president of the Pennsylvania, expressed his opinion as follows: "The Railroad Labor Act has been well described as a writing machinery for peace—not a manual of war. It was my privilege to participate in the negotiations with representatives of railroad employees leading up to the formulation of this legislation and I believe that its greatest guarantee of success is the spirit in which the negotiations were conducted in the desire of all concerned to get together on a satisfactory basis and in their recognition that the public interest in an uninterrupted transportation is of paramount importance."

W. G. Besler, president of the Central of New Jersey, said: "The Transportation Act of 1920, in which was included under Title III, Sections 300 to 316, with the creation of the Railroad Labor Board, was hailed at the time as one of the greatest pieces of constructive legislation ever enacted. Previously enacted railroad labor legislation which the act of 1920 superseded had been similarly acclaimed, only to be scrapped or fall by the wayside. Everyone naturally hopes that the new law may be the long hoped for panacea, but that remains to be seen."

"Apparently that new act will receive its initial baptism within a comparatively short time, and upon the

outcome will depend whether this new legislation will be equal to the test."

L. F. Loree, president of the Delaware & Hudson, stated that: "The Transportation Act passed in 1920 undertook to substitute for the influence of the government, theretofore relied upon, the organized power of the government and set up the United States Railroad Labor Board for the settlement of railroad labor disputes. Perhaps no experiment was ever so surprisingly successful. The board during its brief life functioned in 13,303 cases and in all but about 40 of these cases its award was accepted by the parties. The wages and rules fixed by the board became almost universally effective. There has been no period of six years since the Civil War in which there has been as little interruption to railway traffic by strikes as in the six years during which the board existed. The law creating the Labor Board had, of course, grave defects but these might have been cured by a tithe of the efforts put forth to make 'mediation' workable. The people of the United States desire and should have a government of law. As Washington pointed out in the constitutional convention, influence is not government. The Watson-Parker bill abandons government and sets up influence. It is a substitution of tawdry etiquette for strength and definiteness in a place where, of all others, our government should display the courage and virility that commands respect."

Frank H. Alfred, president and general manager of the Pere Marquette, stated that: "We are cognizant of the fact that the public interest has been eliminated from the new plan, but hopeful that it will work out to the general good. The new structure is not erected on as firm a base as the measure it replaces, inasmuch as the mediators, the final authority, are not vested with those broad powers that they should possess. The machinery, too, is more complicated, it must be admitted. Complex systems necessarily imply longer drawn out hearings where there is an important point involved. To that extent, both the railroads and the employees may find some disadvantage and likewise the public in the end."

A. C. Needles, president of the Norfolk & Western, said: "I regard the new railway labor act as a distinct forward step. It is the result of extended negotiations between representatives of the railroads and the train service organizations, and is the only labor measure I know of which has received the endorsement of both the railway companies and their employees. In my opinion the outstanding feature of the act is that it encourages the settlement of disputes by men and management."

G. LeBoutillier, vice-president of the Long Island, said: "To my mind, this new method of handling labor questions is the best that this country has ever had. I am sure it will be of the greatest benefit in the settlement of disputes between the railroads and their employees. Now that the fifth member of the board of mediation has been appointed, I assume that prompt action will be taken on the recent demands of train service employees and we will have an opportunity to witness the functioning of the new law."

W. B. Storey, president of the Atchison, Topeka & Santa Fe, stated that: "The Railroad Labor Board provision of the Transportation Act became inoperative and practically useless owing to the refusal of the employees to appear before it or to give testimony when summoned. The railroads as a whole were fairly satisfied with it, but some pursued the same course that the employees followed. The new law has the endorsement of the employees and also of some of the railroads which

refused to take part in the Labor Board act. Most of us are hopeful, therefore, that it will serve to prevent interruptions in transportation better than the old act and for this reason are endorsing it. It is my belief, however, that no act which does not have compulsory features will, in the long run, absolutely prevent the troubles which we are seeking to avoid. On the other hand, the country will not stand for anything with teeth in it. In view of these conditions I think the new act an improvement on the old one."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended July 24 totaled 1,085,450 cars, the highest figure reached so far this year, and an increase of 51,931 cars as compared with the corresponding week of last year. As compared with 1924 the increase was 159,141 cars. Increases as compared with the corresponding weeks of both 1925 and 1924 were reported from all districts and in all classes of commodities. Grain and grain products loading amounted to 62,767 cars, an increase of 13,721 as compared with last year. Miscellaneous loading showed an increase of 13,923 cars. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

REVENUE FREIGHT CAR LOADING

Week Ended Saturday, July 24, 1926.

| Districts | 1926 | 1925 | 1924 |
|--------------------------------|------------|------------|------------|
| Eastern | 250,353 | 241,674 | 217,650 |
| Allegheny | 216,323 | 209,761 | 187,708 |
| Pocahontas | 60,790 | 55,176 | 41,839 |
| Southern | 150,371 | 144,128 | 127,681 |
| Northwestern | 166,939 | 157,838 | 138,964 |
| Central Western | 161,073 | 146,894 | 147,415 |
| Southwestern | 79,601 | 78,048 | 65,052 |
| Total Western Districts | 407,613 | 382,780 | 351,431 |
| Total All Roads | 1,085,450 | 1,033,519 | 926,309 |
| Commodities: | | | |
| Grain and Grain Products | 62,767 | 49,046 | 49,861 |
| Live Stock | 27,820 | 26,498 | 27,218 |
| Coal | 185,258 | 179,116 | 146,652 |
| Coke | 11,355 | 9,153 | 7,076 |
| Forest Products | 71,531 | 71,002 | 66,109 |
| Ore | 75,184 | 66,486 | 54,523 |
| Mdse. L.C.L. | 259,320 | 253,926 | 238,429 |
| Miscellaneous | 392,215 | 378,292 | 336,441 |
| July 24 | 1,085,450 | 1,033,519 | 926,309 |
| July 17 | 1,083,626 | 1,012,854 | 930,713 |
| July 10 | 900,977 | 986,893 | 909,983 |
| July 3 | 1,072,624 | 866,199 | 757,904 |
| June 26 | 1,062,252 | 993,173 | 908,251 |
| Cumulative total 30 weeks | 29,179,141 | 28,227,955 | 26,710,331 |

The freight car surplus for the period July 15-22 averaged 218,627 cars, including 64,922 coal cars, 114,158 box cars and 12,943 refrigerator cars. The Canadian roads for the same period had a surplus of 25,857 cars, including 23,200 box cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended July 24 showed a decrease of 1,002 cars from the previous week. Compared with the same week last year there was an increase of 8,353 cars.

| Commodities | Total For Canada | Cumulative Totals |
|---|------------------|-------------------|
| | July 24 1926 | To Date 1926 |
| Grain and Grain Products | 4,109 | 196,560 |
| Live Stock | 2,022 | 57,357 |
| Coal | 6,368 | 143,749 |
| Coke | 205 | 11,073 |
| Lumber | 4,172 | 104,423 |
| Pulpwood | 2,347 | 86,894 |
| Pulp and Paper | 2,140 | 72,500 |
| Other Forest Products | 2,663 | 95,124 |
| Ore | 1,957 | 46,075 |
| Merchandise, L.C.L. | 16,932 | 462,007 |
| Miscellaneous | 16,336 | 388,401 |
| Total Cars Loaded | 59,251 | 1,664,163 |
| Total Cars Rec'd from Connections | 37,947 | 1,075,558 |
| | | 588,605 |

Shippers Oppose Regulation of Trucks

*Virtually unanimous attitude shown at hearings in I. C. C.
motor transport investigation at Chicago and St. Paul*

SHIPPERS of freight by motor truck are opposed to the enactment at this time of legislation placing motor truck transportation under regulation by the Interstate Commerce Commission or by other regulatory bodies. Those who appeared before Commissioner Esch and Examiner Flynn, of the Interstate Commerce Commission, at Chicago and at St. Paul on July 29, 30 and 31, in the Interstate Commerce Commission's investigation into motor bus and truck transportation, testified almost unanimously to this effect. In general their conclusion was that, while there may be a time in the future when motor vehicle transportation should be regulated as rail transportation is regulated, the highway form of transportation is so new and it provides a service so different from that provided by the railways that it should be permitted, for the present at least, to find its position in the transportation scheme without being hampered or its growth impeded by regulation.

J. P. Haynes, of the Chicago Association of Commerce and the Chicago Shippers Conference, was the principal witness before the commission's representatives at the third day's hearing at Chicago on July 29, which was given over to the testimony of shippers and their representatives. Mr. Haynes' statement was based upon returns from a questionnaire sent by the Association of Commerce to its members, designed to elicit from them information as to their use of motor vehicles in the transportation of their freight and their views as to the desirability of regulation of this form of transportation. Mr. Haynes said in part:

We believe the time will come when federal regulation of motor vehicles engaged in interstate commerce as common carriers will be in the public interest. We are not convinced that this time has arrived as the motor truck furnishes an entirely different kind of service from that provided by common carriers now subject to the act to regulate commerce. In the transportation of short haul traffic it affords an expedited door to door service with which the rail carriers as such can not compete on account of terminal delays and other operating conditions. We believe the time has come for a general survey of the motor truck industry to develop its exact status in the transportation field.

516 Trucking Companies in Chicago

There are in operation in Chicago 516 teaming and motor trucking companies for hire, falling in the category of common carriers, contract carriers and private carriers. There are at this time approximately 35 motor truck companies operating as common carriers between Chicago and various points in Illinois, Indiana, Ohio, Michigan, Iowa, Wisconsin and Missouri, which maintain established routes with more or less regular service and rates. We believe that it would be safe to double the number of which we have knowledge without overstating the number of companies operating to and from this market. Some of these companies, however, do a contract carrier's business at special contract rates, in

order to insure a balanced tonnage, and are not common carriers although they compete with common carriers.

The extent to which they are engaged is illustrated by one Chicago shipper whose tonnage from January 1, to July 1, 1926, was 511,594 lb., or 255¾ tons. Fifteen different companies participated in the movement of this traffic. The average radius of territory covered was 50 to 75 mi. The average territory of distribution for the majority of Chicago shippers using motor truck service is within 50 mi. Rates vary, due to the inability to create a balanced tonnage, and are illustrated by the following:

| Origin | Distance to Chicago | Truck Rates Including Store-Door Delivery Per 100 lb. | Railroad Rates Per 100 lb. |
|----------------------|---------------------|---|----------------------------|
| Aurora, Ill..... | 37 mi. | \$.25 | \$.28 |
| Barrington, Ill..... | 37 " | .40 | .40½ |
| Calumet, Ind..... | 22 " | .50 | .40½ |
| Hammond, Ind..... | 20 " | .50 | .31½ |
| Gary, Ind..... | 26 " | .50 | .40½ |
| Rockford, Ill..... | 85 " | .75 | .53 |
| Waukegan, Ill..... | 40 " | .75 | .41½ |

Shippers and receivers have found that the trucks pick up freight at warehouse doors and make delivery at doors of customers. This in many cases saves expense in packing and crating and provides by one operation the minimum time in transit. If handled by rail or electric carriers, it would require three distinct operations, with an inferior service. Such business cannot be termed competitive with railroads and electric lines as they are not in a position to furnish similar service.

After analyzing approximately 400 replies to our questionnaire, we find that the motor trucks are about evenly divided as to the shipper owning his equipment or leasing it from trucking companies on a weekly basis. Many thousands trucks are hired and in daily operation in both intrastate and interstate movement. The service between motor common carriers and motor contract carriers is about evenly divided as to their use, but by far the greatest percentage of tonnage is handled by the motor contract or motor private carrier.

Believe Federal Regulation Unwise

We believe it unwise at this time to place the motor truck industry unde. federal regulation for the following reasons:

1. The advantage to shippers of motor truck transportation is in the elasticity of the service. Rate and service regulation would have a tendency to produce uniformity and make the service inelastic.
2. Federal regulation would tend to retard the development of a new and rapidly growing means of transportation.
3. Motor truck transportation is only now entering the development stage. Insofar as possible it should be left free to find its place as a transportation agency and best fit in as a supplementary means of existing transportation.
4. Federal regulation, if found advisable, should not at this time go beyond a requirement to secure a certificate of public convenience and necessity and to provide

for financial responsibility to indemnify shippers against loss.

In conclusion we believe federal regulation comparable with that now applying to railroads would seriously suppress, if not destroy, motor truck service as it exists today. Overhead and upkeep is expensive in the motor truck business and the process of elimination is very rapid. If the motor truck finds its place as a short haul carrier, that is within a radius of 50 mi. of our commercial centers at rates adequate to maintain their service, it would relieve rail carriers of at least a portion of short haul traffic, which for many years they have claimed was unremunerative."

Other Shippers Testify

H. P. Kahl, representing Sprague, Warner and Company, Chicago, testified that the trucks used by his company performed the best service on hauls not to exceed 35 mi. To indicate the growth of the truck in importance to his firm, he said that in 1924, the trucks handled 4.1 per cent of the outbound shipments; in 1925, 8.2 per cent; and in the first six months of 1926, 9 per cent. Mr. Kahl did not favor regulation of the trucks at this time.

A similar view was expressed by H. D. Pixley, speaking for Carson, Pirie, Scott & Co., and Marshall Field & Co., Chicago. He said that it is more fair to compare motor truck service with express service and that when this is done it is found that motor truck can handle freight within the 75 to 100 mi. radius with greater expedition and at a lower cost than the express company can. "Another important advantage of the motor truck," he said, "is the elasticity of the service and its ability to serve at such times as the service is required, rather than on arbitrary schedules." Regulation of rates and service, he thought, would have a tendency to produce uniformity and destroy much of the elasticity.

H. R. Park, of the Chicago Livestock Exchange, testified that the movement of livestock into Chicago by motor truck has been increasing with great rapidity, but that it is still comparatively small, there being moved into Omaha by truck three times as much as into Chicago, the same being true with regard to the movement of sheep into St. Paul.

J. W. Elliott, of the South Water Street Market Association, testified that the commission merchant now considers the motor truck indispensable in his business. To be satisfactory, he said, the truck must be in a position to move at irregular times over irregular routes.

C. W. Mackey, of the Western Shade Cloth Company, testified that trucks make overnight trips into Indiana from Chicago about twice a week, carrying the shipments of his company, whereas such shipments formerly required three days for transportation by rail. The truck rates are higher, he said, but the service they offer over the short haul offsets the rate disadvantage.

W. J. Kittle, representing farmers who ship milk into Chicago, said the farmers feel that they cannot dispense with the trucks. However, the truck companies have taken advantage of the discontinuance of milk trains and the consequent disappearance of competition to increase the rates, he said. Mr. Kittle also said that the farmers believe that the operators of heavy trucks should be more heavily assessed for the upkeep of the roads.

Road Experts Tell of Survey

Thomas H. MacDonald, chief of the bureau of public roads of the Department of Agriculture, and J. Gordon McKay, chief of the bureau of statistics of the department, described their studies of highway construction and operation. They said that the conclusions drawn from their studies were that the principal business of the

motor truck is local transportation, with hauls not exceeding 60 mi., the trucks performing most efficiently over the 30 mi. haul. In California, 58.1 per cent; in Connecticut, 67 per cent; in Maine, 71.6 per cent; in Pennsylvania, 80 per cent; and in Cook County, Ill., 75 per cent, of the traffic moving by truck does not cover distances greater than 30 mi. Truck transportation divides itself into three classes, it was testified: local transportation, supplementary to rail and water transportation, and special long distance hauling.

Long hauls were declared to be economically unsound, except under special conditions such as the time involved or the special movement of a particular commodity.

Minnesota Commission Objects

The right of the Interstate Commerce Commission to conduct its investigation into motor transport was challenged by Ivan Bowen, a member of the Railroad and Warehouse Commission of Minnesota, at the opening of the hearing in St. Paul on July 30. The Minnesota commission questioned the jurisdiction of the Interstate Commerce Commission in the present proceedings on the ground that there are no motor vehicles operating on the public highways in the state of Minnesota, or elsewhere, which are subject to the Interstate Commerce Commission. Commissioner Esch took the motion under advisement to be forwarded to the Interstate Commerce Commission and said that the Minnesota commission would be permitted to submit argument on its motion, either by brief or by personal appearance before the commission at Washington.

After the filing of the protest of the Minnesota commission, the hearing settled down to the consideration of the testimony of a large number of bus and truck operators and shippers regarding the necessity or desirability of highway transportation service. Representatives of the bus and truck companies and the shippers were invited to testify after railroad representatives announced that they would present no testimony at the hearing.

E. C. Zelle, president of the Jefferson Highway Transportation Company and a pioneer Minnesota bus operator, reviewed the development of bus transportation in the state and cited the action of the Great Northern in entering the bus business through its subsidiary, the Northland Transportation Company, as evidence that at least one railroad was convinced that the public prefers bus service for local transportation. Testifying as to a survey of the bus business in Minnesota made by him, Mr. Zelle said that train removals permitted by the railroad commission in the past year on showing that the territories in question were adequately served by buses, have effected annual savings to the railroads of \$504,600.

There are 13 bus companies operating in the state. Mr. Zelle said, not including those operating between Minneapolis and St. Paul and between Duluth and Superior. These 13 companies carried 2,308,600 passengers in the first six months of 1926. Of this number, 1,320,288 were transported by the Northland Transportation Company in its 140 buses. Of the total number of bus passengers carried only 61,379 crossed the boundaries of Minnesota. In 1925, all bus companies, including those operating in cities, between large cities, and from cities to suburban points, carried 11,000,000 passengers, of which about 2 per cent were inter-state passengers. Mr. Zelle said. He expressed the opinion that state regulation as it exists is desirable but that regulation by the Interstate Commerce Commission is not advisable at this time.

J. E. Edell, traffic manager of the Murphy Transfer

& Storage Co., which is proposing the operation of a large number of common carrier truck lines in Minnesota, declared that common carrier motor transportation is in the early stages of development and should be encouraged and assisted in every way, rather than hampered by too many regulations and restrictions. He was confident that in the course of this development the motor vehicle would find its proper place and would be absorbed into the transportation system without working any hardship upon other types of carriers.

"We haul anything and everything offered in the transportation of goods in less-than-carload lots," said Perry Moore, attorney for a group of 19 common carrier truck operators, using the Minneapolis and St. Paul truck terminals. "This includes everything manufactured, distributed and sold in the Twin Cities and communities served." He declared that truck operation has been profitable and that it is competitive with rail lines for the most part.

L. J. Anderson, traffic manager of the St. Paul Union Stockyards Company, testified that about 7 per cent of the livestock brought to the Union Stockyards is transported in trucks from a territory within a radius of 60 miles and that this method of stock transportation is gaining rapidly in popularity. R. H. Adams, market master of the Minneapolis Central Market, said that an average of 400 trucks daily use the market, most of these coming from farms within a radius of 30 miles but some from distances of 100 miles or more. Virtually all of these trucks are owned by the truck gardeners, who use them only for the transportation of their own products, Mr. Adams said. J. C. Vant Hul, Jr., secretary of the Minnesota Commercial Truck Owners' Association, and secretary of the Twin Cities Transportation Association, declared that while the use of trucks has increased rapidly, less than 500 are in common carrier service, while more than 34,000 are privately owned and used.

Other witnesses included farmers, business men, traffic managers, livestock shippers and representatives of commercial clubs and chambers of commerce, all of whom declared themselves users and advocates of highway transportation. The St. Paul hearing adjourned on July 31. The commission's investigation was continued at Portland, Ore., on August 7.

Train Control Order Suspended as to K. C. S.

WASHINGTON, D. C.

AS reported in last week's issue the Interstate Commerce Commission, Division 1, has suspended until further order its order of June 13, 1922, requiring the installation of automatic train control as it applies to the Kansas City Southern. Commissioner Esch dissented. The text of the report follows:

The Kansas City Southern Railway Company requests that the effective date of our order in *Automatic Train-Control Devices*, 69 I. C. C. 258, entered in this proceeding on June 13, 1922, be suspended, in so far as applicant is concerned, until our further order. The effective date of the order was originally January 1, 1925, but at the request of the applicant for various reasons, it has been postponed until July 1, 1926, with respect to said applicant.

Reasons for Postponement

The grounds upon which the present application for indefinite postponement is based, are briefly, as follows: the risk of accident upon applicant's line is slight; the road is primarily a freight-carrying road; the passenger traffic is comparatively light; only four passenger trains per day, two in each direction

are operated; traffic density is light; the daily average number of trains of all kinds which move over the district of heaviest traffic density is 13, namely, 4 passenger and 9 freight; the road is single track and is not equipped with automatic block signals; there is imperative need for applicant to make capital expenditures for additions, betterments and new construction to provide better and improved service; and the cost to it of installing an automatic train-stop or train-control device is too great in view of the applicant's financial condition.

A further reason advanced is that applicant has under way plans for the creation of a new system in connection with the Missouri-Kansas-Texas and the St. Louis Southwestern; that the acquisitions of substantial interests in the capital stock of these companies has drawn upon the financial resources of applicant to such an extent that if it is compelled to install an automatic train-stop device the cost thereof will reduce its resources relied upon to carry out and complete the proposed merger or combination.

The total number of miles of road operated by applicant is 865. The miles of road between the points designated in our order for the installation of automatic train-control devices is 124 miles, single track, or 14.33 per cent of the total miles operated.

Capital Improvements Planned

Applicant now has under way plans for the construction of a new line between Leeds, Mo., and Grandview, a distance of 13 miles, estimated cost, \$2,400,000. The construction of this line by the Kansas City & Grandview, organized for that purpose was authorized by us on October 6, 1923, 82 I. C. C. 392. This will provide the applicant with its own line between these points where it now has only trackage rights over the line of the St. Louis-San Francisco. The latter line crosses a number of highways at grade. The new line will avoid four of these grade crossings and a number of less important ones.

Applicant's main line has 13 railroad grade crossings, only three of which are protected by interlocking plants. The total estimated cost for interlocking plants at these grade crossings is \$137,328. Applicant has been following a program for protecting these dangerous crossings, which it is feared will be seriously interfered with if it has to expend money on automatic train-control devices.

Applicant is also under contract with the City of Shreveport, La., to eliminate its highway grade crossing in that city, which work, together with track changes involved, is estimated to cost about \$650,000. In addition it has under way and nearly completed new transportation yards and shop layout near Shreveport, which it is estimated will cost in excess of \$600,000. There are other projects of a similar nature which applicant states are urgent and which will when completed add greatly to the safety of operation and improve its service.

Applicant states that its financial position is such that its ability to secure funds for needed capital expenditures by borrowing on the security of mortgage lines is limited and that it is not practicable to raise new money by the sale of stock. The net earnings of applicant and its subsidiary companies, after payment of fixed charges and four per cent dividends on \$21,000,000 preferred stock, available for general purposes including the financing of additions and betterments for the years 1920 to 1925 inclusive, are stated to be as follows: 1920, \$989,672; 1921, \$1,384,078; 1922, \$660,389; 1923, \$1,864,150, which includes settlement incident federal control operations; 1924, \$1,107,107; and 1925, \$1,252,502.

Wayside Signals

We stated in our specifications and requirements that:

"In prevailing practice the primary function of automatic train stop or train control devices is to enforce obedience to the indications of fixed signals; but the feasible operation of essentially similar devices used without working wayside signals may be regarded as a possibility."

The applicant states that it has made investigations as to this possibility and has come to the conclusion that intermittent automatic train stop devices have not been developed suitable for use on its line without working wayside signals.

Applicant has installed upon 14 miles of track an automatic block signal system upon which it has superimposed an automatic train stop device of the intermittent induction type, and in connection therewith five locomotives have been equipped. This is the extent to which it has complied with our order of June 13, 1922. The total cost of this installation is stated to be \$61,000. Based upon this the applicant estimates that the cost of the complete installation required by our order will be as follows: Installing an automatic block signal system of a standard type which it considers necessary, \$373,053; automatic train stop installed upon 124 miles of road as required by our order \$57,350 for wayside equipment and \$30,965 for equipping 23 locomotives, making a total cost of the installation \$461,368.

The record shows that the density of traffic upon the applicant's

line as a whole is extremely light and the speed is relatively low. On the division covered by our order, which is between Kansas City, Mo., and Pittsburg, Kans., a distance of 124 miles, there were operated during the busiest month an average of but 13 trains per day; four of which were passenger trains and nine freight trains. The average speed of the passenger trains on this division is 29.5 miles per hour. The freight handled is largely coal, lumber and other slow-moving commodities, and the average speed of freight trains is 13.2 miles per hour. During a period of heaviest traffic density the average passenger train on this district would meet one passenger train, about two freight trains and would pass one freight train per trip, making a total of four meeting and passing points each trip, consuming about 5 hours time.

During the eleven years from 1915 to 1926 on the division covered by our order there were a total of only eight accidents which could possibly have been prevented by train stop or train control devices. The total damage including property damaged and destroyed and claims for personal injuries paid was \$40,735, or an average of \$3,703 per year.

Upon this record we reach the conclusion that applicant's road is of such a character, and its operating conditions and traffic density are such as not to require at the present time the installation of automatic train stop or train control devices, and that therefore the effective date of our order of June 13, 1922, as amended, should be suspended, in so far as it applies to the applicant, until our further order.

An appropriate order will be entered.
Commissioner Esch dissents.

Public Address System Adapted to Control Train Movements

THE first application of a loud speaking telephone system to convey instructions to switchtenders on the ground is believed to be that made recently at the St. Paul Union Depot, St. Paul, Minn., where the public address system has been installed for directing movements into and out of the east approach to the terminal. Enough volume is obtained without any speech distortion from this telephone installation to enable all of the switchtenders in the yard to receive the yard director's orders under the heaviest traffic interference. During the first shift, 14 switchtenders are employed with an average of 250 movements per shift, while a like number are used on the second shift when the number of movements averages 240. Four men operate the switches during the third shift which is called upon to handle about 99 movements in and out.

Essentially, the equipment, as furnished by the Graybar Electric Company, comprises 32 loud speaking projectors of the balanced armature type located on 30-ft. poles at various switching centers in the yard, a desk transmitter in the yard director's office, an amplifier for increasing the magnitude of the voice current, the current supply apparatus and suitable charging equipment. The amplifier, located in the yard director's office, is

panel mounted and consists of one Type 17-B amplifier and two Type 9-A amplifiers together with associated control apparatus.

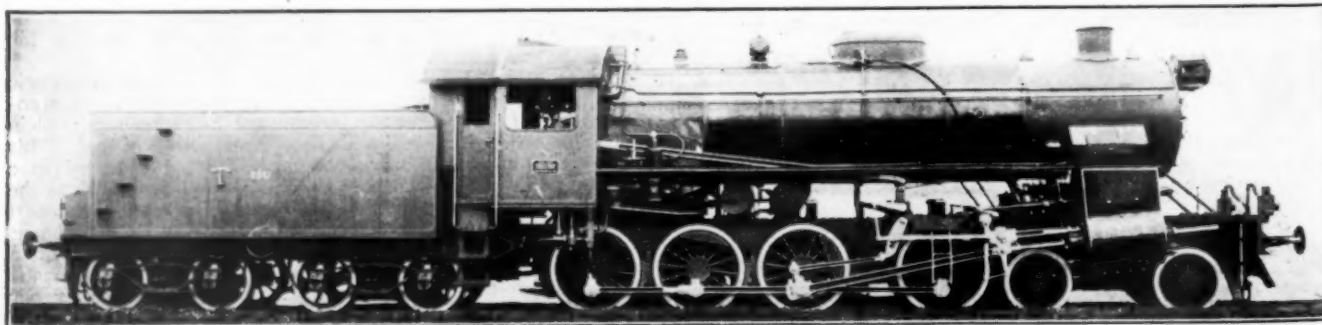
The transmitter serves to convert the sound waves into electric energy which passes on to the amplifying equipment. The 17-B amplifier receives and amplifies the weak voice current obtained from the transmitter. It provides two stages of amplification and makes use of two vacuum tubes, having suitable controls for regulating each stage of amplification. The 9-A ampli-



Left—Amplifier Panel in the Yard Director's Office; Right—A Battery of Three Loud Speaking Projectors Mounted on a 30-ft. Pole

fier units receive their input direct from the 17-B amplifier. These amplifiers are both single stage, power amplifiers using two vacuum tubes operating on a "push-pull" principle and delivering a comparatively large amount of power at voice frequency without noticeably distorting the complex wave form of the voice current.

Four 6-volt storage batteries, connected as two 12-volt units, one being held as a reserve, are used for filament current supply. The plate circuit battery is built up of 180 lead storage cells in series, giving a maximum plate voltage of 380.



Built by the Ernesto Breda Works, Milan, Italy

Transportation Costs on the New York Barge Canal*

Total cost per ton-mile in 1925 more than twice as much as by rail in same territory

I. Introduction

THE Bureau of Railway Economics published a bulletin¹ in May, 1925, in which the total cost of transportation on the New York State Barge Canal was compared with the total cost of transportation by rail.

The bulletin dealt with the capital cost of reconstructing the old Erie Canal into the Barge Canal, during the years 1905 to 1925; the amount of traffic handled on the Barge Canal from its opening in 1919 to 1923; and the various elements entering into the total cost of transportation by canal.

The state of New York has built and owns the New York State Barge Canal, having issued special canal bonds to meet the cost of construction. The state also maintains the canal, which is open to the public as a transportation agency free of toll. In other words, the people of the state of New York have taxed and are continuing to tax themselves to build and maintain a free waterway. The only cost incurred by a shipper of freight on the canal is the charge he pays to the operator of the barge or boat which carries his freight, together with storage and terminal charges and insurance, and the barge operator's charge is low because he is under no expense for the use or maintenance of the waterway, and his only capital investment is in his boat. Because it is government property, no taxes are assessed on the canal or its terminals and warehouses, which fact further reduces the cost of transportation by canal.

In figuring the total cost of transportation via the canal, however, not only the boat operator's charges must be included, but also the cost of carrying the capital invested by the state in the canal, as well as the annual cost of maintenance, repair, and depreciation. These items were all taken into account in Bulletin 36 of the Bureau of Railway Economics.

The bulletin presented certain computations as to the total cost of maintaining and operating the canal, including the items just mentioned, for the fiscal years 1922 and 1923. The total cost for each of the two years were then spread over the total ton-miles of freight traffic reported for those years, so as to arrive at an average transportation cost per ton-mile. This average was compared with the average freight charge per ton-mile made by the railways of the Eastern district in 1923, and also with the average charge made by five of the principal railway lines which, in a sense, compete with the canal.

These comparisons indicated that:

- (1) The total cost of transporting freight by Barge Canal was 3.648 cents per ton-mile in 1922, and 3.481 cents per ton-mile in 1923.
- (2) The average rail freight charge per ton-mile in the Eastern district in 1923 was 1.104 cents.
- (3) On the five railways competing with the canal,

the average freight charge ranged in 1923 from a minimum of 1.005 cents per ton-mile to a maximum of 1.324 cents.

In other words, the actual cost of transportation on the New York State Barge Canal in 1923, when reduced to a ton-mile basis, was more than three times as great as the average rail charge per ton-mile in the same year, and was more than 2½ times as great as the average charge of the railway reporting the highest charge per ton-mile in 1923.

The freight traffic handled on the canal during the years 1922 and 1923 was only a fraction of the estimated maximum freight capacity. Bulletin 36 estimated what the total cost of transportation via the Barge Canal might be if the canal were operated to maximum capacity. This indicated that the total cost of transportation, even under the most favorable conditions of maximum traffic, would be higher than the average rail charge under normal conditions.

Since the appearance of Bulletin 36, certain later information has become available, partly in current annual reports of state officials, and partly in a special report prepared by the superintendent of public works early in 1926. Statistics contained in these reports are discussed in Section II, following, while other matters dealt with in the reports are analyzed in Section III and in the Appendix.

II. Additional Information on New York

State Barge Canal Years 1924 and 1925

Since the appearance of Bulletin 36, two annual reports have been issued by the Superintendent of Public Works of New York, relating to the fiscal years ended June 30, 1924 and 1925. It is now possible to present statistics for those two years in comparison with the statistics for 1922 and 1923 contained in Bulletin 36. In addition, statistics on net tonnage passing through the Barge Canal are available since it was opened to traffic in 1919.

The growth of tonnage has been as follows:

| | | | |
|-----------|-----------|-----------|-----------|
| 1919..... | 1,238,844 | 1923..... | 2,006,284 |
| 1920..... | 1,421,434 | 1924..... | 2,032,317 |
| 1921..... | 1,270,407 | 1925..... | 2,344,013 |
| 1922..... | 1,873,434 | | |

Statistics as to ton-mileage are available only since 1922, as follows:

| | | | |
|-----------|-------------|-----------|-------------|
| 1922..... | 362,442,277 | 1924..... | 448,399,607 |
| 1923..... | 405,925,906 | 1925..... | 543,860,257 |

The annual cost of maintenance and repairs of the Barge Canal, which amounted to \$3,092,811 in 1922 and \$3,805,167 in 1923, was as follows in the next two years, 1924 and 1925, the figures being from annual reports of the state comptroller:

| | Fiscal years ended June 30 | |
|---|----------------------------|----------------|
| | 1924 | 1925 |
| Attorney general, legal..... | \$78,341.73 | |
| Comptroller, canal bureau..... | 12,153.96 | \$6,522.77 |
| State engineer and surveyor, engineering... | 219,099.44 | 2,570.71 |
| Superintendent of public works..... | 3,790,380.54 | 2,817,508.25 |
| Total..... | \$4,099,975.67 | \$2,826,601.73 |

*Abstract of a Bulletin published by the Bureau of Railway Economics.
a Comparison of Transportation Costs by Rail and via Barge Canal,
Misc. Series No. 36, Bureau of Railway Economics, Washington, D. C.,
1925.

While the total cost of maintenance and repairs showed a decline in 1925, it should be noted that Governor A. E. Smith of New York pointed out in his message of January 7, 1925, that in the long run the cost of maintenance and repairs of the canal must increase. His language was as follows:

"Now let us look a little into the future. The canal, like every other giant transportation enterprise, is deteriorating annually. All of its works and appurtenances are subject to the elements and wear and tear. As each year passes we must expect increased cost for maintenance and repairs, especially to the mechanical and electrical equipment."

In his annual report for 1924, the commissioner of canals and waterways of New York state stated that "the canal structures have not been properly maintained." He followed this up in his annual report for 1925 by saying:

"The maintenance of the canal requires a greater expenditure of money every year. The machinery is getting worn and there is a constant demand for replacement."

Utilizing the statistics thus far presented regarding the canal traffic and expenditures in 1924 and 1925, it is possible to compute the total cost of transportation by canal in those years, and to reduce that cost to a ton-mile basis, following the same general method of computation as that utilized in Bulletin 36 for the years 1922 and 1923.

The basic cost of construction will be taken as \$170,053,962, the same total¹ as was used in Bulletin 36 for 1922 and 1923, with no allowance for the several millions of new capital expenditures on the canal in the meantime. Because this figure of total cost is conservative, and because the terminals and grain elevators are making no net contribution to the state treasury but are instead a burden, 5 per cent is again used as the average rate for carrying the capital, as in Bulletin 36. Five per cent on \$170,053,962 is \$8,502,698, which will be taken as the annual cost of the capital both in 1924 and 1925. Dividing this annual cost by the 448,399,607 ton-miles handled in 1924, the average cost of capital per ton-mile in that year becomes 1.896 cents. Dividing the same figure by the 543,860,257 ton-miles of 1925, the average cost of capital per ton-mile in that year is found to be 1.563 cents.

The cost of maintenance and repair in 1924, as already stated, was \$4,099,976. When spread over the ton-miles of that year, the average per ton-mile was 0.914 cents. In the same way, the cost of maintenance and repair in 1925, which amounted to \$2,826,601, represents an average cost per ton-mile (utilizing the ton-miles for 1925) of 0.520 cents.

The average boatman's charge for conveyance of freight is assumed to have been 0.450 cents in both years, as in the case of the former years, which is a moderate basis.

We have, then, the following canal cost per ton-mile in 1924 and 1925, based on the cost and ton-mileage figures already presented for those years:

| | Average cost per ton mile | |
|--------------------------------------|---------------------------|--------------|
| | 1924 (cents) | 1925 (cents) |
| Cost of capital..... | 1.896 | 1.563 |
| Cost of maintenance and repair..... | 0.914 | 0.520 |
| Boatmen's charge for conveyance..... | 0.450 | 0.450 |
| Total..... | 3.260 | 2.533 |

The corresponding average canal costs per ton-mile in 1922 and 1923 were computed in Bulletin 36 as 3.648 cents and 3.481 cents, respectively. These several aver-

¹ This figure was compiled from figures contained in Governor Smith's message of January 7, 1925, as follows:

| | |
|------------------------------------|------------------|
| Construction: | |
| Erie, Champlain and Oswego..... | \$137,020,743.87 |
| Cayuga and Seneca..... | 8,319,221.51 |
| Terminals and grain elevators..... | 24,713,996.93 |
| | \$170,053,962.31 |

ages may be compared with the average rail freight charge per ton-mile in the Eastern district for the same years, as follows:

| | Transportation cost per ton-mile | |
|-----------|----------------------------------|-----------------|
| | By canal (cents) | By rail (cents) |
| 1922..... | 3.648 | 1.172 |
| 1923..... | 3.481 | 1.104 |
| 1924..... | 3.260 | 1.122 |
| 1925..... | 2.533 | 1.108 |

Despite the considerable reduction in canal costs in 1925, due in part to reduced maintenance expenditures and in part to the increase in traffic, the total cost of transportation by the barge canal in 1925 was more than twice as much as by rail in the same territory. Were it possible to foresee a considerable further increase in traffic and also a considerable further reduction in maintenance costs, the canal cost per ton-mile would correspondingly decline. Even so, it seems hardly possible, under any circumstances, that the cost of canal carriage can fall as low as rail carriage. But it is the considered judgment of New York state officials most directly responsible for canal affairs that no great further increase in traffic can be expected, under present conditions on the canal, while on the other hand these officials all expect a marked increase in maintenance costs, to say nothing of necessary expenditures to meet depreciation and obsolescence.

The commissioner of canals and waterways, for example, stated in his report for 1924 that in that year the barge canal was a "disappointment," because it carried "approximately only 10 per cent of its estimated capacity." He added that "the motor truck has undoubtedly deprived the canal of local traffic for all time." His report for 1925 pointed out that the canal must be brought to a "higher state of perfection than now exists," before it can be expected to "carry anything like its maximum capacity."

The superintendent of public works, in his special report of February 26, 1926, said that the canal traffic had "fallen short of expectations," and that the gradual increase in traffic from 1919 to 1925 had "not been sufficient to prove the canal an economic success."

He expressed the belief that no substantial increase in tonnage could be expected under the present conditions of fixed bridges, 12 feet of water over the lock sills, and the necessity to use any but specially designed boats on the canal.

As to increased maintenance costs, the opinion of New York state officials is that they are bound to increase in the future. This opinion was expressed by Governor Smith in his special message of January 7, 1925, and by Canal Commissioner Fuller in his annual report for 1925.

III. Statements by New York State Officials (1924)

It will be of interest to run briefly over statements made within the past two years by officials of the state of New York responsible for canal matters, with respect to the cost of the canal to the people of the state, its serious defects, and possibilities for the future. These statements are quite fully carried in the Appendix, but brief extracts from them are outlined below.

In his annual report for 1924, Royal K. Fuller, commissioner of canals and waterways of New York state, calls attention to the fact that the barge canal in that year carried only 10 per cent of its estimated capacity. He added that something is radically wrong with the canal, or that the day of carrying freight by canal boats is over. He further states the belief that the fundamental trouble lies within the canal system itself.

Commissioner Fuller then discusses what he calls the "Faults of the Canal" under three heads: Faults of de-

sign and construction; faults of maintenance; faults of organization.

Under "faults of design and construction," the commissioner lays emphasis on the fact that the barge canal is not yet completed. He adds that to remedy these faults "will require the expenditure of a good deal of money," and recommends a comprehensive study of the situation.

Under "faults of maintenance," Commissioner Fuller recommends that much of the obsolete equipment now owned by the state for dredging and other purposes be scrapped and replaced by modern equipment. He adds that the canal structures have not been properly maintained, and that serious accident to any canal lock gate would completely suspend canal operations until a new gate could be built. He adds:

"The state has wasted thousands of dollars in the construction of terminals which have never been used and the installation of terminal appliances which have never handled a pound of freight."

After dismissing the charge so frequently made that railroad influence has interfered with the proper construction and maintenance of the canal, Commissioner Fuller says:

"If the New York Central or any other railroad had been as improperly constructed and negligently maintained, it would be as great a disappointment to the stockholders as the barge canal is to the taxpayers."

Under the head of "faults in organization," the commissioner makes a strong plea for reorganizing canal operations on a business basis, instead of continuing it as a political organization. He says:

"I know that this idea will not be received with approval in many quarters, but in the last analysis it comes down to the proposition of whether or not the great waterway of New York State shall be conducted as a business proposition as the other great canals of the world are conducted or as an adjunct to a political machine * * * But the operation of the barge canal is unlike any other governmental function. In the final analysis it is in competition with the railroads, and there are obvious reasons why it is necessary that the canal should be operated certainly as efficiently, and desirably more so, than a railroad organization."

(1925)

In his annual report for 1925, Commissioner Fuller reiterates his statement that the physical condition of the canal is far from satisfactory. Regarding maintenance he says:

"The maintenance of the canal requires a greater expenditure of money every year. The machinery is getting worn and there is a constant demand for replacement. The State cannot be niggardly in its appropriation for the maintenance of the canal if it is going to preserve the great waterway which has been constructed."

He repeats his former recommendation that the large quantity of antiquated, inefficient and obsolete equipment "inherited from the Erie Canal" be scrapped.

(1926)

Far more important than these annual reports of the commissioner of canals and waterways was the special report submitted by his superior officer, the state superintendent of public works, Frederick Stuart Greene, to Governor Alfred E. Smith on February 26, 1926. A large part of this report appears in the Appendix, but its principal conclusions are summarized briefly below:

1. The traffic carried on the barge canal has fallen short of expectations. It is now floating only about one-tenth of its tonnage capacity.

2. The net cost of the canal to the taxpayers in 1925 was \$10,573,627.

3. In 1925 it cost the state \$4.51 per ton for all freight loaded on the canal, regardless of length of haul. It would have been cheaper for the state if all the freight carried on the canal had been put in railroad cars and the state had paid the freight bills.

4. The statement that the canal saves the people of New York \$50,000,000 annually in "depressed" rail rates

is not proven; first, because it is open to question if the Interstate Commerce and Public Service Commissions would allow rail rates to be increased \$50,000,000 a year, even if the canal were not in existence; second, are other states lacking canals proportionately overcharged by the railroads because of such a lack?

5. In any case, is not a club costing \$10,500,000 a year an expensive weapon to hold over the heads of the railroads?

6. The fundamental reason for the very small use of the canal is ice. The canal is closed by ice for five months each year.

7. Another obstacle is the existence of immovable bridges over the canal, permitting a clearance of only 15 feet. This necessitates the use of a special type of boat which cannot be operated advantageously on any other body of water.

8. In connection with the canal system, the state has 66 terminals, at which there are 53 warehouses, costing from a few thousand to more than a million and a half dollars each. During the past two years no freight was handled at 49 of these terminals, and only 5 of the 53 warehouses were used for canal freight. Many of the terminals have never been used for canal tonnage since the day they were built.

9. The canal has not only too many terminals, but is over-equipped with freight-houses, machine-shops, derricks, and other terminal facilities, seldom if ever used, but for which maintenance costs must be paid each year.

10. The two grain elevators built by the state have thus far been financial failures. In 1925, the two-million bushel elevator at Gowanus earned the largest receipts in its history, a total of \$139,635. Its total operating expenses in that year were \$160,659, while the annual capital charge on its cost of construction, computed at 4 per cent, was \$98,302. Its total cost for 1925, exclusive of depreciation, was \$258,961, while it earned only \$139,635, producing a net loss to the state of \$119,326.

11. The one-million bushel elevator at Oswego was opened on May 16, 1925, but no wheat was offered until October 21. Its operating expenses for the seven and a half months during which it was operated amounted to \$90,006, while the capital charge of 4 per cent on cost of construction for seven and a half months was \$41,126, or a total cost during that period, exclusive of depreciation, of \$131,132. Its total receipts during the same period were only \$1,397. The net loss to the state was \$129,735.

12. Spending money for terminals and grain elevators in the hope that increased tonnage would follow has thus far been unsuccessful.

Atlantic Coast Line Railroad Company

You are called for Train 8765

Leaving at 11:59 ^{A.M.} _{P.M.}

WATCH OUT FOR THE SAFETY OF YOURSELF AND OTHERS

(The use of this card adopted at suggestion of a Trainman of the
Atlantic Coast Line Railroad Company.)

A. C. L. Safety Kink

A Safety lecture via the call-boy; for occasional use

General News Department

Wage increases of approximately one and one-half cents an hour have been granted by the Chicago & Alton to certain of its shopmen, agents and telegraph operators to bring their rates up to a level with those of employees of similar classifications on other roads in the middle west.

Active and retired employees of the Louisville & Nashville, who have been 30 or more years in service, will meet at Louisville, Ky., on September 18 to perfect plans for organizing a grand lodge. Under the plan, the system will be divided into four districts, each of which will have an individual club.

In a recent decision overruling an order of the Virginia State Corporation Commission, the Virginia Supreme Court of Appeals held there was no merit in the contention that because the Pullman Company paid railroads to transport its cars the railroads should not enforce a Pullman car surcharge. The order of the commission had removed the surcharge between points within the state limits.

A decision of the Illinois Commerce Commission refusing to approve a lease by the Chicago, Milwaukee & St. Paul to the Railway Terminal Warehouse Company providing for the erection of a four story warehouse on railway property in Chicago, is considered a possible obstruction to future development of air rights of railways. Chief objection of commission was to 99-year lease by railroad and to the fact that lease contained no revaluation clause. The commission held that there should be revaluation every 10 years.

The first Edward DeMille Campbell Memorial lecture, established by the American Society for Steel Treating, will be presented by Dr. William Minot Guertler, of Berlin, Germany, at the annual convention of the American Society for Steel Treating and the National Steel and Machine Tool exposition, to be held in Chicago the week of September 20. The lecture will be "On the Corrosion Resistance of Steels." Other lectures of Dr. Guertler will be "On the Hardness of Metals" and "Light Metal Alloys."

The Pennsylvania will discontinue on September 15 ferry service between Cooper's Point, Camden, N. J., and the foot of Vine street, Philadelphia, Pa. This service has been operated by a subsidiary corporation, the Cooper's Point & Philadelphia Ferry Company. Abandonment of the service has been forced by reason of the fact that during only two out of the last ten years have the revenues been sufficient to meet expenses. Since the opening of the new Delaware river bridge on July 1, which is constructed practically over the route of the Cooper's Point & Philadelphia Ferry Company's line, the traffic has diminished to such an extent that the company can not earn operating expenses.

Sargent Replies to Rate Case Criticism

Criticism of the manner in which executives of western railroads had handled their application before the Interstate Commerce Commission for general rate increases, which was recently denied, was answered by Fred W. Sargent, president of the Chicago & North Western, in a statement issued on July 30. "The executives of the railroads took action months ago," said Mr. Sargent, "to secure a readjustment of class rates in western trunk line territory and this case will soon be heard by the commission. The denial of the request for a 5 per cent general increase in freight rates by the Interstate Commerce Commission does not mean that the railroads in some sections of the west will not be allowed advances in tariffs. The ruling of the commission was directed against all western railroads to the Pacific coast but the ruling does not affect the carriers' application for higher rates from what is known as western trunk line territory. As this application remains undecided and as roads in this terri-

tory are most in need of increased rates, there is still a possibility for such increases."

Cost of Coal in May

The average cost per ton of coal used by Class I railroads as fuel for road locomotives in freight and passenger train service in May was \$2.62, as compared with \$2.73 in May, 1925, according to the Interstate Commerce Commission's monthly bulletin of railway fuel statistics. The railroads consumed in May 7,844,354 tons of coal, at a cost of \$20,583,202. They also consumed 165,556,788 gallons of fuel oil, at 2.92 cents a gallon, making a total of \$4,827,017. In May of last year the average cost of fuel oil was 3.25 cents.

Fall Meeting of the American Welding Society

The fall meeting of the American Welding Society will be held in Buffalo, November 17, 18, and 19. An international welding and cutting exposition which will be held in connection with the meeting will open Tuesday afternoon, November 16. The technical sessions include railroad, welding apparatus, welding science in the engineering curriculum of universities, and welding in a gaseous atmosphere. The entertainment includes a trip to Niagara Falls, a view of the Falls from the American side, with an inspection trip through the Niagara Falls power house, a buffet supper on the Canadian side and a special illumination of the Falls. There will be the usual annual fall banquet and a meeting of the American Bureau of Welding, the Board of Directors and the Welding Wire Specifications Committee.

The Changes of Ten Years

A summary of changes in transportation rates, wages of railway employees, taxes and other items involved in railway operation is presented in the August 1 Bulletin of the Atchison, Topeka & Santa Fe. Summarizing, the bulletin shows that the percentages of increases in 1925 as compared with 1915 were as follows: in freight rates, 52.08 per cent; in passenger fares, 48.26 per cent; in freight rates and passenger fares combined, 51.24 per cent; in expenditures for fuel, 94.29 per cent; in expenditures for materials, supplies and miscellaneous, 136.03 per cent; in hourly compensation of employees, 134.76 per cent; in annual compensation of employees, 97.63 per cent; in expenditures for labor, 131.35 per cent; in cost of living, 69.30 per cent; in total operating expenses, 124.47 per cent; in taxes, 169.37 per cent; in investment in road and equipment, 35.23 per cent. The decrease in the average number of hours worked per employee over the ten year period was 15.84 per cent.

Oregon Seeks Greater Speed on New Facilities

The Public Service Commission of Oregon has filed with the Interstate Commerce Commission a petition asking it to order the railroads affected by its order of May 3, authorizing the construction of new lines in Oregon, to show cause why the order has not been complied with. The commission, in passing on six applications for certificates authorizing the construction of new lines authorized the Southern Pacific system to build certain lines on condition it could make an arrangement with the Oregon Trunk, of the Hill system, for trackage rights covering part of the mileage, and also authorized the Oregon Trunk to build a line into Southern Pacific territory conditioned on a trackage right arrangement over Southern Pacific lines for part of the way. The roads have thus far not been able to reach an agreement. The petition of the Oregon commission says that the federal commission's decision expected the various carriers to undertake in good faith to come to an understanding which would carry out its conclusions with no unnecessary delay and that "the carriers have failed to take any action looking toward early construction of the rail-lines requested

and authorized." It adds that the delay is "resulting in serious injury to the state of Oregon and retarding materially development which would otherwise occur."

Activities of Illinois Chamber of Commerce Transportation Committee

The transportation committee of the Illinois Chamber of Commerce, Chicago, has issued a report covering its activities in connection with transportation legislation which was before the 69th Congress. The report reviews the action taken by the committee on the Gooding bill, Senator Cummins' consolidation bill, the Watson-Parker Railway Labor bill, and regional appointments of interstate commerce commissioners. This committee, which was organized in December, 1925, to further the development of cordial relations between the railroads and those they serve, now numbers 14 men of whom but three are railroad officers. The committee consists of Chairman T. S. Hammond, president of the Whiting Corp., Harvey, Ill.; Hale Holden, president of the Chicago, Burlington & Quincy, Chicago; George A. Blair, traffic manager of Wilson & Co., Chicago; Adolph Mueller, Mueller Co., Decatur, Ill.; F. J. Cahill, the Borden Co., Dixon, Ill.; H. G. Atwood, American Milling Co., Peoria, Ill.; W. L. Hodgkins, Brownell Improvement Co., Chicago; Charles E. Herrick, Brennan Packing Company, Chicago; H. G. Clark, assistant to the president, Chicago, Rock Island & Pacific, Chicago; Campbell Holton, Campbell Co., Bloomington, Ill.; W. P. Whitney, Springfield Paving Brick Co., Springfield, Ill.; L. L. Munn, Arcade Mfg. Co., Freeport, Ill.; J. L. Beven, vice-president, Illinois Central, Chicago; D. B. Piersen, Stephens-Adamson Mfg. Co., Aurora, Ill.; and Secretary C. G. Ferris, Illinois Chamber of Commerce, Chicago.

Valuation Progress

In a statement issued under date of July 20, Frederick H. Lee, secretary of the Presidents' Conference Committee on Federal Valuation of the Railroads, reports that 169 final valuations have been issued since January 15, 1926, making a total of 302 reports issued as of June 30. Of these, 178 accounts covered properties of carriers which did not protest against the tentative valuation and 48 reports covered properties of carriers which either filed a protest but failed to enter an appearance at the date assigned for hearing, or presented no evidence or brief in support of their objections and claims. In these cases the tentative valuation has been made final by order of the commission. There are also about 100 cases in which the tentative valuations have also become final by reason of the failure of the carriers to file a protest within the statutory period of 30 days after the service of the tentative valuation. It is expected that the commission will in due course issue its reports and orders making such valuations final.

Since December 31, 1925, the commission has served 158 tentative valuations of which 24 were Class I carriers, making a total of 840 valuations served to June 30, 1926. Among the 24 Class I carriers were the Buffalo, Rochester & Pittsburgh; the Chicago, Burlington & Quincy; the Colorado & Southern; the Lehigh Valley; the Missouri-Kansas-Texas and the Missouri-Kansas-Texas of Texas.

The final and tentative reports served as of June 30, are:

| Final Reports | Number of Valuations | Number of Corporations | Miles of Road | Percentage of Total Mileage (244,377 miles of road) |
|-----------------------------|----------------------|------------------------|---------------|---|
| Final by decision and order | 302 | 347 | 14,539 | 5.9 |
| Final and Tentative Reports | | | | |
| Served | 840 | 1,224 | 151,642 | 62.1 |
| To be served | 214 | 713 | 92,735 | 37.9 |
| | 1,054 | 1,937 | 244,377 | 100.0 |

The expenditure of the Bureau of Valuation for the six months' period from July 31, 1925, to December 31, as reported by Commissioner Lewis in a statement to the special committee on appropriation was \$772,904, making a total expenditure by the Bureau of Valuation from the beginning of the valuation to December 31, 1925, of \$27,435,101. During the six months ending December 31, 1925, \$3,857,440 was expended in connection with valuation work by Class I carriers reporting to the Presidents' Conference Committee, making a total amount so expended by these carriers during the period of approximately 13 years ending December 31, 1925, of \$87,785,835.

Senator Cummins Dies

Senator Albert B. Cummins, of Iowa, the author of several important legislative measures in Congress affecting the railways, died at his home in Des Moines, Iowa, on July 30. His death was due to heart disease, which was the culmination of an illness of several months. Senator Cummins was born in Pennsylvania on February 15, 1850, and was educated as an engineer. He was for several years engaged in railway service, becoming finally assistant chief engineer of the Cincinnati, Richmond & Ft. Wayne, now a part of the Pennsylvania. Later he studied law, moving from Chicago to Des Moines in 1878 and serving for a time as a railroad attorney there. He was a member of the Republican national committee from 1896 to 1900, and was governor of Iowa from 1902 to 1908. He entered the Senate of the United States in the latter year, where he remained continuously until his death. Although in recent years Senator Cummins was considered a "regular" Republican, he first obtained prominence as an "insurgent" in Iowa, defeating the regular Republican ticket in the senatorial election on what was considered an anti-railroad platform. He later turned from the "insurgent" group and became allied more definitely with the regular Republican party. The outstanding piece of railroad legislation with which Senator Cummins had to do was the Transportation Act of 1920, or the Esch-Cummins bill, under which the roads were returned to private operation after the war period of federal control. He was chairman of the Senate committee on Interstate Commerce in 1919, when this legislation was prepared, having been on the Interstate Commerce Committee since early in his Senate career. Partly as a result of his authorship of the Transportation Act, Senator Cummins was removed from the chairmanship of the Interstate Commerce Committee in 1923 at the insistence of the Republican "insurgent" group in the Senate. Senator Cummins was scheduled to retire from the Senate at the expiration of his present term in 1927, having been defeated in the recent Republican primary for United States senator by Smith W. Brookhart.

Railway Revenues and Expenses

The net railway operating income of the Class I railroads for the first six months this year totaled \$494,866,776, which was at the annual rate of return of 4.94 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. For the first six months last year the net railway operating income was \$439,398,416 or 4.49 per cent.

Operating revenues for the first six months this year amounted to \$3,028,560,861, compared with \$2,896,616,605 for the corresponding period last year, or an increase of 4.6 per cent. Operating expenses totaled \$2,299,851,388, compared with \$2,239,959,256 last year, or an increase of 2.7 per cent.

Class I railroads during the first six months this year paid \$182,474,572 in taxes, an increase of \$13,546,105 or 8.0 per cent over those of the same period in 1925.

Expenditures for maintenance for the first six months period totaled \$1,054,005,103, an increase of \$35,361,831. Maintenance of way expenses were \$413,138,797, an increase of \$24,722,668 or 6.4 per cent, while maintenance of equipment expenses were \$640,866,306, an increase of \$10,639,163 or 1.7 per cent.

Twenty-two Class I railroads operated at a loss for the six months period this year, of which eight were in the Eastern district, one in the Southern district and thirteen in the Western district.

For the month of June, Class I railroads had a net railway operating income of \$107,335,654, which was at the annual rate of 5.49 per cent. For the same month last year their net amounted to \$92,148,575, or 4.82 per cent.

Operating revenues in June totaled \$539,864,683, as compared with \$507,034,436 in June, 1925, or an increase of 6.5 per cent. Operating expenses totaled \$390,190,450, as compared with \$376,077,689 in the same month last year, or an increase of 3.8 per cent.

The net railway operating income for the Class I railroads in the Eastern district during the first six months totaled \$264,143,672, which was at the annual rate of 5.71 per cent. For the same period last year their net was \$234,091,058, or 5.17 per cent. Operating revenues for the first half of 1926 totaled \$1,529,538,015, an increase of 4.8 per cent, while operating expenses totaled \$1,156,648,874, an increase of 2.9 per cent.

Class I railroads in the Eastern district for June had a

net railway operating income of \$57,776,431, compared with \$50,146,912 in June last year.

Class I railroads in the Southern district during the first six months had a net railway operating income of \$79,564,480 at the annual rate of 5.65 per cent. For the first six months last year they had a net of \$75,340,681, which was at the annual rate of 5.60 per cent. Operating revenues of the Class I railroads in the Southern district for the six months totaled \$440,540,132, an increase of 8.2 per cent, while operating expenses totaled \$325,759,435, an increase of 7.7 per cent.

The net railway operating income of the Class I railroads in the Southern district in June amounted to \$12,446,785, while in the same month last year it was \$11,039,086.

Class I railroads in the Western district for the first six months had a net railway operating income of \$151,158,624, at the annual rate of 3.79 per cent. For the same period last year, the net railway operating income amounted to \$129,966,677, at the annual rate of 3.31 per cent. Operating revenues of the Class I railroads in the Western district for the first six months amounted to \$1,058,482,714, an increase of 2.7 per cent, while operating expenses totaled \$817,443,079, an increase of one-half of one per cent.

For June, the net railway operating income of the Class I railroads in the Western district amounted to \$37,112,438, as compared with \$30,962,577 last year.

The summary for the Class I roads of the United States follows:

| | 1926 | 1925 |
|---|-----------------|-----------------|
| Total operating revenues..... | \$3,028,560,861 | \$2,896,616,605 |
| Total operating expenses..... | 2,299,851,388 | 2,239,959,256 |
| Taxes..... | 182,474,572 | 168,928,467 |
| Net railway operating income..... | 494,866,776 | 439,398,416 |
| Operating ratio..... | 75.94 | 77.33 |
| Rate of return on property investment.. | 4.94% | 4.49% |

MONTH OF JUNE

| | | |
|---|---------------|---------------|
| Total operating revenues..... | \$539,864,683 | \$507,034,436 |
| Total operating expenses..... | 390,190,450 | 376,077,689 |
| Taxes..... | 32,966,345 | 29,902,132 |
| Net railway operating income..... | 107,335,654 | 92,148,575 |
| Operating ratio..... | 72.28 | 74.17 |
| Rate of return on property investment.. | 5.49% | 4.82% |

Meetings and Conventions

The following list gives name of secretaries, dates of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 165 Broadway, New York City. Next meeting, May 24, 1927, Mayflower Hotel, Washington, D. C. Exhibited by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—F. Speer, 1021 Filbert St., Philadelphia, Pa. Meeting with Air Brake Association.

AMERICAN ASSOCIATION OF ENGINEERS.—M. E. McIver, 63 E. Adams St., Chicago.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—J. D. Gowin, 112 W. Adams St., Chicago. Annual meeting, September, 1926.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago. Next meeting, June 21-23, 1927, Mackinac Island, Mich.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, October 28-29, 1926, Hot Springs, Ark.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Annual convention, June, 1927, San Francisco.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—T. E. Welsh, Chicago, North Shore & Milwaukee, Highwood, Ill. Next meeting, October 12-14, 1926, Detroit, Mich.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 292 Madison Ave., New York. Annual convention, October 4-8, 1926, Cleveland, Ohio.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borchardt, 202 North Hamilton Ave., Chicago, Ill.

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.

Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York. Freight Station Section (including former activities of American Association of Freight Agents).—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association).—J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section.—J. C. Caviston, 30 Vesey St., New York. Next meeting, April 19-21, Chicago.

Telegraph and Telephone Section (including former activities of the Association of Railroad Telegraph Superintendents).—W. A. Fairbanks, 30 Vesey St., New York. Next meeting, Sept. 21-23, 1926, Swampscott, Mass.

Division II.—Transportation (including former activities of the Association of Transportation and Car Accounting Officers).—G. W. Covert, 431 South Dearborn St., Chicago, Ill.

Division III.—Traffic, J. Gottschalk, 143 Liberty St., New York.

Division IV.—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Annual convention, March 8-10, 1927, Chicago. Exhibit by National Railway Appliances Association, March 7-10.

Construction and Maintenance Section.—E. H. Fritch.

Electrical Section.—E. H. Fritch.

Signal Section (including former activities of the Railway Signal Association).—H. S. Balliet, 30 Vesey St., New York, N. Y. Next meeting, September 7-9, Hotel Ambassador, Los Angeles, Cal.

Division V.—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Exhibit by Railway Supply Manufacturers' Association.

Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Next meeting, September 14-16, 1926, Book-Cadillac Hotel, Detroit, Mich.

Division VI.—Purchases and Stores (including former activities of the Railway Storekeepers' Association).—W. J. Farrell, 30 Vesey St., New York, N. Y. Exhibit by Railway Supply Manufacturers' Association.

Division VII.—Freight Claims (including former activities of the Freight Claim Association).—Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.

Car Service Division.—C. A. Buch, 17th and H Sts., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry. 319 N. Waller Ave., Chicago. Annual convention, October 12-14, 1926, Richmond, Va. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—H. W. Byerly, General Immigration Agent, Northern Pacific, St. Paul, Minn.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Next annual convention, March 8-10, 1927, Chicago. Exhibit by National Railway Appliances Association, March 7-10.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railway Association, Division V.)

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C. M. & St. P. Ry., 11402 Calumet Ave., Chicago. Annual convention, September 1-3, 1926, Hotel Sherman, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, 1319-21 F St., N. W., Washington, D. C.

AMERICAN SOCIETY FOR STEEL TREATING.—W. H. Eisenman, 4600 Prospect Ave., Cleveland, Ohio.

AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, 1315 Spruce St., Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—George T. Seabury, 29 W. 39th St., New York. Regular meetings 1st and 3rd Wednesday in month, except July and August, 33 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Marion B. Richardson, Associate Mechanical Editor, *Railway Age*, 30 Church St., New York.

AMERICAN TRAIN DISPATCHERS' ASSOCIATION.—C. L. Darling, 10 East Huron St., Chicago, Ill. Biennial convention, July 18, 1927.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—E. J. Stocking, 111 West Washington St., Chicago. Annual meeting, January 25-27, 1927, Nashville, Tenn.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual convention, 1927, New Orleans, La.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry. Room 411, C. & N. W. Station, Chicago. Annual meeting, October 27-30, 1926, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, 17th and H Sts., N. W., Washington, D. C.

ASSOCIATION OF RAILWAY SUPPLY MEN.—S. A. Witt, Detroit Lubricator Co., Chicago. Meeting with International Railway General Foremen's Association, September 7-10, Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Division I.)

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Fred M. Condit, Fairbanks, Morse & Co., Chicago. Meeting with American Railway Bridge and Building Association, October 12-14, Richmond, Va.

CANADIAN RAILWAY CLUB.—C. R. Crook, 129 Charron St., Montreal, Que. CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, 514 East Eighth St., Los Angeles, Calif. Regular meetings, second Friday of each month, 514 East Eighth St., Los Angeles.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—R. E. Giger, 721 North 23rd St., East St. Louis, Ill. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.

CHICAGO CLAIM CONFERENCE. Personal Injury Section.—F. L. Johnson, Chicago & Alton R. R., 340 Harrison St., Chicago. Meets 12:30 p. m., first Monday each month, Sherman Hotel, Chicago.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—A. S. Sternberg, Belt Ry. of Chicago, Polk and Dearborn Sts., Chicago. Next convention, September 21-23, Hotel Sherman, Chicago.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—Bradley S. Johnson, W. H. Miner, Rookery Bldg., Chicago, Ill. Meeting with Chief Interchange Car Inspectors' and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—D. R. Boyd, 811 Union Central Bldg., Cincinnati, Ohio. Meetings, 2nd Tuesday in February, May, September and November.

CLEVELAND STEAM RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, first Monday each month, Hotel Hollenden, Cleveland.

EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, 614 F St., N. W., Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Association, Division VII.)

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Next convention, August 17-19, 1926, Hotel Winton, Cleveland, O. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—Edwin T. Jackman, 710 W. Lake St., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Office of Permanent Commission of the Association, 74 rue du Progrès, Brussels, Belgium. General secretary, P. Ghilain. Next session of the Congress, Spain, 1930.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. B. Hutchison, 1809 Capitol Ave., Omaha, Neb. Annual convention, May 10-13, 1927, Hotel Sherman, Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Annual convention, September 7-10, 1926, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—W. H. Harris, 343 S. Dearborn St., Chicago. Earl E. Thulin, assistant secretary, 715 Peoples Gas Bldg., Chicago. Meets with International Railway Fuel Association.

MASTER BOILER MAKER'S ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York. Next annual convention, Chicago.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Div. V.)

MASTER CAR BUILDERS' ASSOCIATION.—(See A. R. A., Div. V.)

MOBILE TRAFFIC AND TRANSPORTATION CLUB.—T. C. Schley, 71 Conti St., Mobile, Ala. Regular dinner meetings 6 p. m., on 2nd Thursday of each month, Cawthon Vineyard, Mobile, Ala.

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—F. A. Morse, vice-president, Potosi Tie & Lumber Co., St. Louis, Mo. Next convention, 1927, Nashville, Tenn.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Annual convention, November 2, 1926, Asheville, N. C.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL HIGHWAY TRAFFIC ASSOCIATION.—Elmer Thompson, 12 East 53rd St., New York.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 845 South Wabash Ave., Chicago. Annual exhibition, March 7-10, 1927, at convention of American Railway Engineering Association.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section: E. R. Cott, Safety Agent, Hocking Valley Ry., Columbus, Ohio.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2nd Tuesday in month, excepting June, July, August and September, Copley-Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July and August.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

PURCHASES AND STORES DIVISION.—(See American Railway Association, Division VI.)

RAILWAY ACCOUNTING OFFICERS ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C. Annual meeting, June, 1927, Denver, Colo.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 1406 Packard Bldg., Philadelphia, Pa. Annual meeting, November, 1926, Hotel Commodore, New York.

RAILWAY CAR MANUFACTURERS' ASSOCIATION.—W. C. Tabbert, 61 Broadway, New York.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Annual meeting with Association of Railway Electrical Engineers, October 27-30, Chicago.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—F. W. Venton, Crane Co., 836 S. Michigan Ave., Chicago. Meeting with Traveling Engineers' Association, September 14-17, Hotel Sherman, Chicago.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md. Annual meeting, October 12, 1926.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A., Division IV., Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division and Purchases and Stores Division, A. R. A.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A., Division I, September 21-23, 1926.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa. Next meeting, September 24-25, 1926, White Sulphur Springs, W. Va.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvt. Road, Baltimore & Ohio, Pittsburgh, Pa. Next convention, September 21-23, 1926, Auditorium Hotel, Chicago. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—R. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHEASTERN CARMEN'S INTERCHANGE ASSOCIATION.—Clyde Kimball, Indian Shops, Atlanta, Ga. Meets semi-annually.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. L. Carrier, Car Serv. Agent, Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—W. R. Mau, Vanadium Alloys Steel Co., Latrobe, Pa.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo-Ajax Corporation, Hillburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association, September 21-23, Chicago.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual meeting, September 14-17, 1926, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—Bruce V. Crandall, 189 West Madison St., Chicago. Regular meetings, 3rd Monday each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—Edgar S. Nethercut, 1735 Monadnock Block, Chicago, Ill.

Traffic News

Special party rates of a fare and a third for the round trip for parties of 15 persons or over and a rate of one fare for the round trip for parties of 100 or over, have been agreed upon by railways in Washington, Idaho, Oregon and California. The rates are particularly designed to accommodate persons attending small conventions.

Inauguration of 63-hour train service between Chicago and Los Angeles and San Francisco, Cal., will take place on October 15, when the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Southern Pacific, the Chicago & North Western and the Union Pacific put on extra fare trains to these points. All the 63-hour trains will leave Chicago in the evening, arriving at their destinations about nine o'clock on the third morning.

The St. Louis-San Francisco has reduced the running time of the Memphian between St. Louis, Mo., and Memphis, Tenn., by 20 min. This is the second reduction in schedule time made by the Frisco during the present year. The distance from St. Louis to Memphis is 305.4 miles and the actual running time is 7 hr. and 35 min., which gives an average speed of approximately 39 miles per hour. Under the new schedule, the train will leave St. Louis at 11:25 p. m. as at present and will arrive at Memphis at 7 a. m. instead of 7:20 a. m. Returning it leaves Memphis at 11:20 p. m. as at present and arrives at St. Louis at 7 a. m. instead of 7:20 a. m.

Faster freight service between Missouri river and other points on the Chicago, Burlington & Quincy and Paducah, Ky., and through service between these points and Mobile, Ala., and other Gulf coast cities, via the Paducah gateway, was effected by the Burlington on August 1, according to an announcement by C. E. Spens, vice-president in charge of traffic of the Burlington. The running time between Chicago and Paducah has been shortened by 24 hrs. Direct connections for Mobile and other Gulf coast points is provided through the recent arrangement by which the Gulf, Mobile & Northern secured trackage rights over the Nashville, Chattanooga & St. Louis between Jackson, Tenn., and Paducah. The new through route from the Gulf to the north is provided by the Gulf, Mobile & Northern to Jackson, the N. C. & St. L., from Jackson to Paducah, and the Burlington to Chicago and other points. Under the new schedule, perishable freight leaving Mobile at 7:15 p. m., via the G. M. & N., and leaving New Orleans, La., at 9:40 p. m. via the New Orleans & Northeastern and Laurel, Miss., reaches Chicago at midnight the third day for delivery the following morning. Corresponding service southbound affords fourth morning teamtrack or dock deliveries of consignments leaving Chicago at 7:15 p. m. Third morning delivery is also provided from Chicago to Atlanta, Ga., via Paducah and the N. C. & St. L., with a proportionate reduction in schedule time in both directions between Chicago and Nashville, Chattanooga, Memphis and all points reached through these southern gateways.

Grain Rate Cut Discussed by Western Lines

The rate reduction of 6 cents a hundred pounds on all-rail grain shipments from Minneapolis to Chicago and the eastern seaboard proposed by the Minneapolis & St. Louis, was discussed at a conference of traffic officers of the Chicago & Northwestern, the Minneapolis & St. Paul & Sault Ste. Marie, the Chicago, Rock Island & Pacific, the Chicago, Burlington & Quincy, the Chicago Great Western and the Chicago, Milwaukee & St. Paul in Chicago on July 30. E. B. Boyd, chairman of the Western Trunk Line committee, announced after the conference that the rate question was fully discussed but that no action was taken because of the opposition to the reduction in rates by the grain interests in the Missouri river district. It was intimated that the lines represented at the conference may ask the Interstate Commerce Commission not to sanction the reduction proposed by the M. & St. L.

Traffic Through Panama Canal

The tonnage passed through the Panama Canal in the fiscal year 1926 amounted to 24,774,591 tons, according to the Canal Record, as compared with 22,855,151 in the preceding year and 26,148,878 in 1924, the record year. Excluding tanker tonnage, however, the net tonnage showed an increase of 12 per cent over 1925 and of 16 per cent over 1924. Tanker tonnage amounted to approximately 25 per cent of the total net tonnage in 1926 as compared with 39 per cent in 1924 and the gain in commercial traffic excluding the oil was approximately 2,500,000 tons as compared with 1924. In 1926 5,197 ships passed through the canal, as compared with 4,673 in 1924. During the first six months of this year the cargo tonnage was greater than in any previous six months of the canal's history either as to total tonnage or traffic exclusive of oil tankers.

Motor Transport News

Motor transportation in Iowa has not yet definitely indicated its ability to operate at a profit, according to B. M. Richardson, a member of the board of railroad commissioners. The operating expenses of 45 bus lines having a total mileage of 3,491 were more than 82 per cent of the gross revenues in 1925. The operating expenses of 77 truck lines, having an aggregate mileage of 2,511, were more than 60 per cent of their gross receipts in the same period. Motor bus and truck lines operating under the jurisdiction of the commission in Iowa did a total business of \$860,000 in 1925. Of 45 bus lines reporting, 10 showed deficits and 42 showed less than \$2,000 net operating income.

Motor Buses in New York State

Reporting to the Public Service Commission of New York for the year 1925 were 297 motor bus lines consisting of 75 corporations and 222 individuals operating 1,132 buses in New York State. These figures do not include the bus lines in New York City subject to the jurisdiction of the Transit Commission. A check of the records of the Motor Vehicle Bureau shows the registration of 1,177 motor buses during the year 1925, so it would appear that the reports to the Public Service Commission are practically complete.

The combined seating capacity of the 1,177 motor buses registered with the Motor Vehicle Bureau is 23,820 passengers, an average of a little over 20 passengers per vehicle.

A. T. Dice Protests Against

Bus Competition to Jersey Shore

Agnew T. Dice, president of the Reading, has addressed the following letter to Mayer Bader of Atlantic City, N. J., protesting against independent bus competition with its seashore train service:

"The increase in passenger motor bus operation to and from Atlantic City prompts me to write a frank letter to you in the hope that the entire situation may receive the most careful consideration of your administration and the people of Atlantic City.

"I believe that you will agree with me that the growth of Atlantic City has been predicated largely upon the service given by the steam carriers. It has been the policy of the railroads serving your resort to spare no expense in giving transportation unparalleled in this country. In frequency of schedule, speed, safety, comfort and equipment, Atlantic City finds itself the possessor of transportation assets incalculable in value not only to the present prosperity of the resort but to its future. Many millions of dollars have been expended and are being expended to maintain and improve this service.

"The new Camden Terminal, new 130-pound rail, additional track, new signal devices, and steady replacement of equipment resulting in all-steel trains powered by the latest word in locomotives, and new ferry boats, represent a few of the expenses—over \$10,000,000—we have borne recently in order to continue to give Atlantic City the fine train service it enjoys.

"The people of Atlantic City want a new passenger terminal. We believe that they are entitled to it, and are actively working on the plans to provide it. Our spirit of co-operation is just as keenly alive as ever. For instance, when we were asked to

relieve traffic by discontinuing excursion trains on Mississippi avenue we promptly transferred the service to our main station. For three decades we have extensively advertised Atlantic City and have earnestly worked for its prosperity.

"We have maintained a schedule of fares designed to meet all conditions, ranging from 44 cents per ride for commuters to \$2.06 for one-way tickets. I need not call to your attention the enormous volume of one-day visitors on excursions at \$1.50 from Philadelphia and corresponding fares from more distant points, delivered in Atlantic City as a single item of our service. However, all this has never produced a sufficient amount combined with revenue from freight traffic, to make the Atlantic City Railroad in itself a profitable enterprise.

"We have ever been hopeful, however, of the future of Atlantic City and the other seashore resorts, and naturally expected to participate in a normal increase in traffic, and thus enjoy the fruits of our efforts, but are now faced with the possibilities of the present type of unrestricted bus competition using public highways and streets for running ground and terminals.

"It is not to be conceived that the combined bus operation could safely handle the peak summer or holiday crowds, or that the regular commuter, the backbone of summer prosperity and realty advance, would rely upon slow bus transportation. In a three-day period recently, over 500 bus trips were counted in and out of Atlantic City, nearly all of which were en route between points served by our railroad, chiefly Philadelphia and Atlantic City, and the amount of business handled by the buses is sufficient to lower the average business of the railroad to such an extent that the maintenance of the present schedule is problematical and a continuance of large capital expenditures unjustifiable.

"The motor bus has its own particular fields, such as local transportation agencies in metropolitan areas, or as lateral feeders to rail lines in outlying districts, or as a means of continuing transportation service in territories where travel is lightly patronized local rail facilities, co-ordinated with express service, or as a modern means of developing new territories along the lines the railroads used in building up their traffic. Generally, we do not believe they should go much further except in unusual cases.

"The public will have to decide as to whether they can afford to provide roadway and terminals for these highway lines, particularly those which seek to duplicate and possibly replace adequate railroad service gradually developed over a long period."

Long Island Favors Buses in Proper Sphere

George LeBoutillier, vice-president of the Long Island, authorized the following statement of the railroad's position respecting bus line operations in competition with the railroad:

"The management of the Long Island Railroad has just asked for an injunction against the operation of a bus line between Bay Shore and New York. Recently, too, we have opposed the granting of a franchise for a bus line to operate between Glen Cove and New York and between Freeport and Bellmore. Injunctions will also be asked against certain lines operating outside the city limits.

"In opposing the establishment of bus lines which would parallel the Long Island Railroad, we believe that we are protecting the interests of our patrons as well as the interests of the railroad company. We realize that the abandonment of passenger trains would mean a definite loss in prestige and convenience to communities formerly served. The local passenger train offers a dependable all-weather service for the transportation of passengers. It enables passengers traveling to distant points to purchase tickets and check baggage direct to their destinations. It also provides facilities for the conveyance of mail, express and baggage. These services can be replaced only in part by the services of motor vehicle carriers.

"The people of every community where bus lines are proposed in competition with the railroad would do well to study the situation thoroughly to ascertain which form of transportation is the better equipped to furnish the dependable, efficient, well-rounded service they require.

"The Long Island Railroad does not assume an attitude of general antagonism to all motor vehicles operating as common carriers. They should be developed wherever there is real need for the service performed. More than fifty bus lines are now in operation between various communities on Long Island. Most

of them serve these communities locally, and in many cases parallel the railroad for short distances where local passenger train service is not as frequent as the localities require. The railroad has helped these bus lines in many ways and co-operates with them.

"It should be remembered by railroad patrons, however, that bus operations do not relieve the congestion at terminals and on trains during rush hours, but take traffic at non-rush hours at full rates, thus depriving the railroad of revenue that it needs to enable it to handle the commuters at such low fares as exist. Where existing railroad service is adequate for all reasonable requirements, motor bus lines should not be permitted to operate to the detriment of the railroad.

"There is a field in which the operation of bus lines is justified as an advantage to the public. This field is chiefly in extending and supplementing railroad service, rather than in competing with it. For example, bus lines can perform a valuable service to the public by affording transportation facilities in districts where traffic conditions would not justify the expense of railroad operation. They can function to advantage as feeders of the railroad by operating laterally from local stations into adjacent territory, thus extending the areas that enjoy convenient access to rail facilities. In both these ways the bus lines are of benefit to the public and at the same time assist rather than injure the railroad.

"Another field of usefulness for bus lines is in furnishing transportation between points served by the railroad, but so situated that bus lines can afford more frequent and convenient service, but the benefits to the public in improved transportation outweigh any objection that might be based upon loss of traffic by the railroad.

"The Long Island Railroad recognizes the propriety of allowing bus lines to perform services such as have been mentioned, but not to duplicate service already being performed satisfactorily by the railroad. There is no justification for the operation of bus service which parallels and competes with the railroads unless it is clearly shown that the service performed by the railroad fails to meet the reasonable requirements of the public.

"But unless there is conclusive evidence that the railroad service offered is inadequate the railroad is justly entitled to enjoy the fruits of its efforts to build up the territory it serves, and its revenues should be safeguarded from the inroads caused by unnecessary and injurious competition."

Baltimore & Ohio to Operate Buses in New York and Newark

The Baltimore & Ohio, which had previously been reported as considering the operation of buses in New York City to connect with the Jersey City terminal of the Central of New Jersey, which will be its Metropolitan terminal from September 1 when its contract for the use of Pennsylvania station, New York, expires, has now definitely announced its plans. Buses will be operated from a location on Forty-second street near Grand Central Terminal and from other points in New York to the Jersey City terminal and likewise bus service will be provided between Newark, N. J., and the Jersey Central station at Elizabeth. The Baltimore & Ohio, in using the Pennsylvania's terminal facilities; has been serving Newark and the provision of bus service to Elizabeth will enable it to continue doing so.

The initial bus terminal of the service will be located in the Pershing Square building, Forty-second street and Park avenue, New York. There will be another at the Waldorf-Astoria hotel, Fifth avenue and Thirty-third street. In addition, the buses will stop at other convenient points in the city for the purpose of taking on or discharging passengers. The buses will use two routes in New York from the Pershing Square terminal—one directly downtown via the Liberty street ferry and another via Thirty-third and Twenty-third streets to the Twenty-third street ferry.

There will be three Newark terminals for the Newark-Elizabeth buses, viz., the Jersey Central station, the Public Service Railway station and the Robert Treat hotel. No extra charge will be made for the bus service. The equipment to be used will be of parlor car type with individual seats for 23 passengers, with a compartment for luggage in the rear. Each bus will be manned by a uniformed attendant in addition to the chauffeur. The New York buses will be operated for the railroad by the Fifth Avenue Coach Company and in Newark by the Public Service Transportation Company.

Commission and Court News

Interstate Commerce Commission

Charges proposed by the Atlantic Coast Line and the Seaboard Air Line for refrigerator cars used in the transportation of fruits, vegetables and other perishable freight in less-than-carloads between points in the southeastern rates were found justified in a decision issued by the Interstate Commerce Commission on July 29 and the order of suspension which had been issued by the commission was vacated.

The Interstate Commerce Commission has rendered a decision on complaint of the Oklahoma Traffic Association finding rates on sugar in carloads from points in Louisiana, from Sugarland and Texas City, Tex., and from points in Kansas, Colorado, Nebraska, Idaho and Utah, to points in Oklahoma, unreasonable and prescribing a scale of distance rates as reasonable for the future.

Freight tariffs filed by southwestern railroads proposing routing restrictions and instructions which would result in increased rates on livestock, in carloads, between points in Louisiana and Texas, on the one hand, and points in Kansas and Oklahoma, on the other hand, were found not justified in a decision issued by the Interstate Commerce Commission on July 29. The railroads had contended that if they are compelled to continue low rates on stock cattle they should be permitted to confine the rates to routes which would enable them to handle the traffic in the most economical manner and that they should not be required to maintain rates to destination points from which the originating carrier is not in a position to secure the outbound haul on the fat cattle, but the commission, in its report, said that what the railroads had proposed was not entirely consistent with this contention.

Rules, regulations and practices of the Denver & Salt Lake relating to the distribution of cars to coal mines were found by the Interstate Commerce Commission to be unlawful, unreasonable and unduly prejudicial, in a decision issued on August 2 on a complaint filed by the Victor-American Fuel Company and other coal operators located on the line. The commission also found unlawful the railroad's practice of not counting against a mine's distributive share cars placed thereat for railway fuel loading. The Moffat Coal Company and the Colorado & Utah Coal Company were found "to have received an undue preference with their knowledge and consent by reason of their agreement with the carrier and the practice of said carrier under that agreement," but the commission finds not sustained the allegation "that defendant railroad permitted the Moffat Coal Company with its knowledge and consent incident to the operation of two tipples at one mine so to report the working time and production of said mine as to secure to said mine an unreasonably excessive and unduly prejudicial rating."

In a supplemental report on the Southern Class Rate Investigation the Interstate Commerce Commission has modified its finding No. 14 to provide that in computing distances "the shortest routes shall be used over which carload traffic can be moved without transfer of lading." The original finding was that distances should be computed over "the shortest workable routes," and the southern roads filed a petition asking the commission to change it, stating that even if a system of grouping be used for all except the shorter hauls, it will be necessary in compiling the new intraterritorial tariffs to compute from 1,200,000 to 1,400,000 separate distances. They said the determination of what they termed the "economical distance," as contrasted with the absolute short-line distance, "involves the use of informed judgment" and "opens the door for endless argument as to the correctness of the result reached." The petition was served upon the parties to the proceeding and many replies were received by the commission from representatives of shippers and others. The commission, in deciding upon a wording somewhat different from that suggested by the carriers, also modified one of the distance scales of rates prescribed in the report to allow slight increases to offset the effect of the new rule.

Equipment and Supplies

Locomotives

THE NORFOLK & WESTERN is inquiring for 10 Mallet (2-8-2) type locomotives.

THE ST. PAUL BRIDGE & TERMINAL contemplates buying one eight-wheel switching locomotive.

THE RICHMOND, FREDERICKSBURG & POTOMAC contemplates buying six locomotives, to include four Pacific type.

THE ATCHISON, TOPEKA & SANTA FE has ordered 40 locomotive tenders from the Baldwin Locomotive Works. The inquiry for this equipment was reported in the *Railway Age* of June 26.

THE CHESAPEAKE & OHIO has given contracts for repairing 25 Mallet type locomotives to the following shops: American Locomotive Company, Richmond, Va., 10; Newport News Shipbuilding & Drydock Company, Newport News, Va., 10, and Erie Railroad, Hornell, N. Y., 5.

Freight Cars

THE PERE MARQUETTE is now inquiring for 25 all steel hopper coal cars of 30-tons' capacity.

THE ILLINOIS TRACTION COMPANY is inquiring for 100 drop bottom gondola cars of 50-tons' capacity.

THE GENERAL SUGAR COMPANY has ordered 100 cane cars of 30 tons' capacity from the Magor Car Corporation.

THE PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS, Chicago, has ordered 3 all-steel gondola cars of 50 tons' capacity from the American Car & Foundry Company.

THE CUBAN AMERICAN SUGAR COMPANY has ordered 100 sugar cane cars from the Gregg Company. Inquiry for this equipment was reported in the *Railway Age* of April 24.

THE AMERICAN REFRIGERATOR TRANSIT COMPANY is inquiring for 2,000 refrigerator cars. In the *Railway Age* of July 31 this company was reported as contemplating buying this equipment.

Passenger Cars

THE RICHMOND, FREDERICKSBURG & POTOMAC has ordered one dining car from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of July 3.

Iron and Steel

THE ERIE is inquiring for 150 tons of steel for bridges.

THE ATLANTIC COAST LINE is inquiring for 220 tons of steel for bridges.

THE NORTHERN PACIFIC has ordered 350 tons of structural steel from the Mt. Vernon Bridge Company.

THE SOUTHERN RAILWAY has ordered 17,000 tons of rail from the Tennessee Coal, Iron & Railroad Company.

THE LONG ISLAND has ordered 110 tons of steel for a bridge at Elmhurst, from the Harris Structural Steel Company.

THE SOUTHERN PACIFIC has ordered 210 tons of structural steel for use at Klamath Falls, Ore., from the Moore Drydock Company.

Machinery and Tools

THE MISSOURI PACIFIC is inquiring for one grinder.

THE PERE MARQUETTE has ordered a 5-ft. radial drill from the Niles-Bement-Pond Company.

THE TEXAS & PACIFIC has ordered an 84-in. boring mill from the Niles-Bement-Pond Company.

THE ATLANTIC COAST LINE has ordered a 16-in. geared head lathe from the Niles-Bement-Pond Company.

THE MISSOURI PACIFIC has ordered two 100-ton bushing presses from the Niles-Bement-Pond Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered a 4,000-lb. double frame hammer from the Niles-Bement-Pond Company.

THE COLORADO & SOUTHERN has ordered one steam shovel with crawler treads from the American Hoist & Derrick Company.

THE ALABAMA GREAT SOUTHERN has ordered a 2,000-lb. hammer and a 6-ft. radial drill from the Niles-Bement-Pond Company.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered a journal turning and axle lathe from the Niles-Bement-Pond Company.

THE INTERNATIONAL-GREAT NORTHERN has ordered three 24-in. by 24-in. motor driven crank planers and one 48-in. Putnam car wheel borer from Manning, Maxwell & Moore, Inc.

THE CHICAGO & NORTH WESTERN has ordered one 30-ton locomotive crane from the American Hoist & Derrick Company. This company is also inquiring for one pattern maker's turning lathe.

THE TENNESSEE COAL, IRON & RAILROAD COMPANY has ordered two 1½-in. hot pressed nut machines and two 1¼-in. automatic nut burring machines from Manning, Maxwell & Moore, Inc.

THE ATCHISON, TOPEKA & SANTA FE has ordered a radius link grinder from Manning, Maxwell & Moore, Inc. An order has also been placed with Joseph T. Ryerson & Son, Inc., for a Ryerson-Conradson, 21-in. by 10-ft. lathe.

THE ILLINOIS CENTRAL is inquiring for 4 floor grinders. This company has ordered 4 lathes, 4 Ohio shapers, one oil groover, 2 Pitt type flue cleaners and one Quintuple steel frame combination punch and shear from Joseph T. Ryerson & Son, Inc. An order has recently been given for one heavy turret lathe to Manning, Maxwell & Moore, Inc.

THE DELAWARE, LACKAWANNA & WESTERN has ordered a 90-in. Putnam locomotive journal lathe and quartering machine; a 1,500-lb. steam hammer; a 4,000-lb. steam hammer; 4 Chambersburg power hammers; one 2-in. National heavy forging machine; one 1½-in. vertical shear; one 4-in. pipe machine; one 6-in. centering machine from Manning, Maxwell & Moore, Inc.

New Machine Tools for Atlantic Coast Line

The Atlantic Coast Line has ordered machine tools for installation in its new shops at Uceta, Fla., from Manning, Maxwell & Moore, Inc., as follows:

- 1 90-in. Putnam journal lathe and quartering machine.
- 1 800-ton hydraulic wheel press.
- 1 600-ton mounting and demounting wheel press.
- 2 100-ton hydraulic bushing presses.
- 1 2,000-lb. steam hammer.
- 1 1,500-lb. steam hammer.
- 1 2,000-lb. steam drop hammer.
- 1 80-ton geared trimming press.
- 1 die sinking machine.
- 1 mechanical power hammer.
- 1 7½-in. Libbey turret lathe.
- 1 radius link grinder.
- 5 36-in. heavy duty vertical drills.
- 8 sensitive drills.
- 2 20-in. Universal monitor lathes.
- 1 6-spindle automatic valve grinder.
- 3 metal saws.
- 5 14-in. motor driven portable lathes.
- 2 13-in. by 14-ft. motor driven portable lathes.
- 5 24-in. by 12-ft. motor driven portable lathes.
- 2 20-in. by 10-ft. motor driven portable lathes.
- 5 18-in. by 10-ft. geared head engine lathes.
- 2 100-ton Shaw overhead traveling cranes.

- 2 15-ton Shaw overhead traveling cranes.
- 3 10-ton Shaw overhead traveling cranes.
- 4 3-ton Shaw wall cranes.
- 2 10-ton Shaw gantry cranes.

Signaling

THE WABASH has placed orders with the Union Switch & Signal Company for 11 style "T2," three-position semaphore signals, 49 relays, 13 switch circuit controllers and other materials required for the installation of 19 miles of automatic signaling between Carrollton and Hardin, Mo.

THE CENTRAL RAILROAD OF NEW JERSEY has ordered from the Union Switch & Signal Company 20 sets of locomotive equipment for installing three-speed continuous train control on 20 additional engines used over the three-speed train control territory on their line between Red Bank and Winslow Junction.

THE CHICAGO & WESTERN INDIANA has placed an order with the General Railway Signal Company for eight Model 2A three-position upper quadrant bracket signals for shipment to 87th street, Chicago. This order also includes four A. R. A. pipe bracket posts having both front and rear platforms to accommodate two signals each.

MORGAN'S LOUISIANA & TEXAS has placed an order with the General Railway Signal Company for eight Model 2A two-position lower right-hand quadrant spindle type 8 to 10 volt d.c. motor mechanisms and one Model 2A three-position right-hand upper quadrant spindle type 20 volt d.c. motor mechanism for shipment to Morgan City, La.

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company "S-8" electro-mechanical interlocking equipment for installation at the Montrose, Ill., interlocking plant. The entire machine equipment consists of eight electric lever units, with a 24-lever mechanical machine. The construction work at the plant will be carried out by the regular signal field forces of the railroad.

THE SEABOARD AIR LINE has contracted with the Union Switch & Signal Company for the complete installation of two mechanical interlocking plants at Drexel and Taconey, Fla. These plants are located at crossings of the Atlantic Coast Line Railroad, and will be provided with 12-lever frame Saxby and Farmer interlocking machines. Mechanical high signals with style "S" electric distant signals will also be provided, and mechanical time locking equipment for controlling train movements over these crossings is included.

THE NEW YORK CENTRAL has placed an order with the General Railway Signal Company covering materials for electric interlocking plant at Stanley Tower, Toledo, Ohio, consisting of 40 Model 5A switch machines; 27 three-indication type G color light signal units; 25 two-indication type D color light signal units; two 1-indication type D color light signal units; 17 two-indication type F color light dwarf signals; 223 Model 9E neutral relays; 78 Model 20 motor relays; 20 six-way relay boxes; 10 four-way relay boxes; five Model 5 switch circuit controllers.

THE TEXAS & PACIFIC has placed an order with the General Railway Signal Company covering one 12-lever Model 2 unit lever type electric interlocking machine, having 10 working levers and 2 spare spaces, for installation at Terrell, Texas. This order also includes one operating switchboard, two Model 2A 110-volt d.c. lower quadrant signal mechanism; four derail layouts using Model 5A switch machines, three type "D" color light signals, four Model 5 switch circuit controllers, four Model 9E polarized relays, 10 Model 9D neutral relays and four type "H" power-off relays.

THE MISSOURI PACIFIC has placed an order with the General Railway Signal Company for one 8-lever section Saxby & Farmer interlocking machine for addition to an existing machine at Dupon, Ill. An additional order has also been placed with the General Railway Signal Company for one single unit table interlocker having three indicators electrically operated and one indicator mechanically operated by the armature of the electrical lock, which is to be operated on an 8-volt circuit. This order also includes three Model 5 low-voltage switch machines arranged for remote control for shipment to Osawatomie, Kan.

Supply Trade News

The American Steel Foundries has moved its St. Louis office from the Frisco building to the Railway Exchange building.

H. H. Pleasance, vice-president and sales manager of the United Alloy Steel Corporation, Canton, Ohio, has resigned that position to become affiliated with the Bourne-Fuller Company.

George H. Charls, president of United Alloy Steel Corporation, Canton, Ohio, has resigned following the merger of the company with which he was connected with the Central Alloy Steel Corporation.

The Marion General Excavator Company, Marion, Ohio, has been organized to engage in the manufacture of light caterpillar crane and shovel dragline combinations and small excavating machines.

The Chicago Railway Signal & Supply Company has appointed the Brinard Sales & Construction Company, Inc., 114 Liberty street, New York, N. Y., as eastern sales representative.

Joseph Robinson, Inc., has been organized to own and manage all United States and foreign patent rights for the Robinson automatic air and steam hose connector, a \$1,200,-

000 development. Mr. Robinson, who previously owned these rights individually, has transferred them all to the company. The capitalization of the company is 1,500 no par value cumulative preferred shares, and 25,000 no par value common shares. The officers are: Joseph Robinson, president; G. E. Matheson, vice-president; J. H. Rogers, secretary and treasurer. The directors are: J. H. Rogers, president, British American Trading Corporation; R. M. Wolvin, president,



Joseph Robinson

British Empire Steel Corporation; E. W. Poindexter; L. J. Howarth, treasurer, Liberty Trust Company, and Joseph Robinson. The company's patent rights will be worked under license to an operating company, plans for which are progressing. The office of the company is in New York. At a recent meeting of the board of directors, Joseph Robinson, inventor of the Robinson automatic connector, was elected president of the Joseph Robinson, Inc. Mr. Robinson was born at Dayton, Wash., on July 31, 1889, and was educated in the common schools. He begun his engineering career as a blacksmith, going through machine shop and foundry practice to the drafting board, and from there into research and developmental engineering. While his engineering developments are extensive, Mr. Robinson is best known for his invention and development of the Robinson automatic connector.

C. R. Ahrens, formerly eastern sales representative of the Chicago Railway Signal & Supply Company, has been appointed eastern sales representative of the Illinois Iron & Bolt Company, with headquarters at 30 Church street, New York.

L. J. Belnap has been elected president of the **Worthington Pump & Machinery Corporation**, New York, and C. Philip Coleman, retiring president, has been elected chairman of the board. Mr. Belnap was formerly president of Rolls Royce of America and chairman of Wills St. Claire Company, of Detroit.

Robert I. Fretz, for the past year in charge of boiler tube sales of the **Reading Iron Company**, Reading, Pa., has been appointed district sales manager of pipe sales in the Reading district which embraces New York state, excluding New York City and eastern Pennsylvania, excluding Philadelphia. Mr. Fretz succeeds R. L. M. Taylor, who has resigned.

The **Graybar Electric Company** has opened a new sales and warehouse branch at 51 Chapel street, Hartford, Conn. It is expected to be in operation by August 15. J. W. Saliadine, in charge of Hartford sales for the Graybar Company, will be sales manager of the new branch and warehouse. The territorial jurisdiction will be under the New York sales office.

Arthur H. Weston has been appointed representative of the **Clark Car Company**, with headquarters in the American National Bank building, Richmond, Va. He will handle the company's business in the states of Maryland, Virginia, North Carolina and South Carolina. Mr. Weston was formerly, for many years, sales engineer for the Symington Company, and more recently vice-president of the Car Devices Company.

Obituary

Thorsten E. Dahlberg, one of the founders of the Celotex Company and assistant to the president until 1924, died at El Paso, Texas, on July 27.

Trade Publications

STRUCTURAL STEEL SHAPES.—This is the first edition of a 195-page handbook issued by the Carnegie Steel Company, Pittsburgh, Pa., which presents in condensed form the essential data on structural steel shapes required by the designer and detailer. Except insofar as the new book embodies revisions necessary to bring it up to date, the text pages are essentially duplicates of pages forming a part of the Carnegie Pocket Companion, which has long been a standard guide for structural steel designers. The matter omitted in the newer volume relates primarily to built-up steel members and data on wooden structural members, mathematical tables, etc., that are readily available in other forms.



Underwood & Underwood

Commissioner Esch and Examiner Flynn Administering the Oath to a Witness at the Opening of the Interstate Commerce Commission's Bus and Truck Investigation in Chicago

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—The Interstate Commerce Commission has authorized the Corona & Santa Fe, to be controlled by lease and stock ownership by the Atchison, Topeka & Santa Fe, to construct a line from Alberhill, Cal., to Porphyry, a distance of approximately 15 miles. The line is estimated to cost \$981,704.

CHICAGO & EASTERN ILLINOIS.—A contract has been awarded to G. A. Johnson & Son, Chicago, for the construction of an engine terminal at Evansville, Ind., reported in the *Railway Age* of June 19.

CHICAGO, MILWAUKEE & ST. PAUL.—The Federal Court at Chicago has authorized expenditures for the following construction work: Extension of passing tracks and new passing tracks, \$28,000; bridge work at various points, \$148,000; water stations and treating plants at Channing, Mich., Hawarden, Ia., Bird Island, Minn., Bowdle, S. D., and Summit, Ia., \$77,000; mechanical coaling station at South Beloit, Ill., \$28,000; electrification of yards at Harlowton, Mont., and Avery, Idaho, \$25,000; and improvements at Milwaukee stockyards, \$40,000.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—A contract has been awarded to T. & L. B. Libby, Minneapolis, Minn., for the construction of an addition to the enginehouse at St. James, Minn., at an estimated cost of \$50,000.

GULF, MOBILE & NORTHERN.—Construction will soon be undertaken of a bridge across the Pearl River at Jackson, Miss.

GULF, MOBILE & NORTHERN.—This company plans the reconstruction of the line of the Jackson & Eastern between Union, Miss., and Lena, and an extension from Lena to Jackson. General improvement work on the Gulf, Mobile & Northern is under way, consisting of widening cuts and fills, reducing grades, ballasting and replacing light rail with heavy rail.

ILLINOIS CENTRAL.—Bids have been received for the construction of a subway at Bloomington, Ill., which is estimated to cost approximately \$150,000.

KANSAS INDUSTRIAL BELT.—Denial of this company's application for a certificate for the construction of a line of 3.85 miles southeasterly from Fredonia, Kan., is recommended to the Interstate Commerce Commission in a proposed report by Examiner W. J. Schutrumpf.

MISSOURI PACIFIC.—A contract has been awarded to the Woods Brothers Construction Company, Lincoln, Neb., for the construction of a 2,500-ft. reinforced concrete and steel bridge over the Platte river at LaPlatte, Neb., estimated to cost \$250,000.

MISSOURI PACIFIC.—Negotiations for the purchase of real estate upon which to erect the new general office building at St. Louis, Mo., have been completed, and plans for it have been prepared. The structure will be 17 stories in height and will cost approximately \$2,000,000. It will front on Olive, Pine and 13th streets, in St. Louis. The office building will be a feature of the proposed Memorial Plaza and its architecture will harmonize with the public and other buildings to be erected in connection with the city's building program on this site. With the exception of the first floor, which is to be leased for shops and stores, the entire building will be used by the railway.

NEW ORLEANS GREAT NORTHERN.—This company has applied to the Interstate Commerce Commission for authority to build an extension from Nogan, Miss., through the city of Jackson, Miss., to the west bank of the Pearl river, to connect with the line of the Jackson & Eastern now under construction to that point.

NORFOLK & WESTERN.—A contract for overhead bridge work, involving a total expenditure estimated at \$35,000, has been awarded to the Virginia Bridge & Iron Co., Roanoke, Va.

NEW YORK CENTRAL.—This company has awarded contracts totaling approximately \$555,000, as follows:

| Nature of work | Location | Probable cost | Firm to which contract was awarded |
|---|-------------------------------------|---------------|--|
| Constr. of septic tanks, sand filters, sludge beds and grease traps. | Selkirk, N. Y..... | \$45,000 | Mohawk Dredge & Dock Co., Herkimer, N. Y. |
| Constr. of duct lines and splicing chambers, Riverdale to Ludlow, N. Y..... | New York City and Yonkers, N. Y.... | 165,000 | Fred T. Ley & Co., Inc., New York City. |
| Elim. of grade crossing, Moshulu Avenue | New York City.... | 70,000 | Thos. Crimmins Contracting Co., New York City. |
| Erection, riveting and painting steel superstructure of viaduct, St. Clair Pl. to W. 137th St. | New York City... | 235,000 | Fredk. Snare Corp., New York City. |
| Reconstruction of Bridge W-519 | Genesee Jct., N. Y. | 40,000 | Bates & Rogers Construction Co., Chicago. |

NORFOLK & WESTERN.—This company has awarded a contract to J. P. Pettyjohn & Co., Lynchburg, Va., for the construction of a roundhouse and machine shop at Williamson, W. Va., to cost approximately \$115,000.

NORTHERN OKLAHOMA.—Assistant Director Burnside of the Bureau of Finance of the Interstate Commerce Commission has submitted a proposed report recommending a denial of this company's application for authority to build a line of 11 miles north from Vinita, Okla.

PENNSYLVANIA.—A contract has been awarded to the Roberts & Schaefer Company, Chicago, for the construction of a 650-ton, reinforced concrete coaling station at Ft. Wayne, Ind.

SOUTHERN.—The Cincinnati, New Orleans & Texas Pacific has awarded a contract to the Virginia Bridge & Iron Co., Roanoke, Va., for the construction of a highway truss bridge to cost approximately \$130,700.

SOUTHERN PACIFIC.—Plans have been prepared for the construction of shop and terminal buildings at Klamath Falls, Ore., which are estimated to cost \$325,000.

SOUTHERN PACIFIC.—A contract has been awarded to the W. J. Harris Contracting Company, El Paso, Texas, for the construction of the extension from Edinburg, Texas, to Falfurrias, a distance of approximately 50 miles. The new line will connect the Southern Pacific at Edinburg with the San Antonio & Aransas Pass at Falfurrias.

WESTERN PACIFIC.—Plans are being prepared for the construction of an icing plant at Marysville, Cal., which is estimated to cost approximately \$50,000.

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—*Acquisition of Subsidiary Lines.*—The Interstate Commerce Commission has approved the acquisition of the Oklahoma, New Mexico & Pacific and the Ringling & Oil Fields by the Healdton & Santa Fe, which has been organized in the interest of the Atchison, Topeka & Santa Fe for that purpose. The commission has also approved the issuance by the Healdton & Santa Fe of \$50,000 of capital stock and the acquisition of this stock by the Atchison, Topeka & Santa Fe. In addition it has approved the leasing of the Oklahoma, New Mexico & Pacific and the Ringling & Oil Fields by the Gulf, Colorado & Santa Fe as well as the issuance by the Santa Fe of not exceeding \$1,300,000 4 per cent bonds for delivery to the Healdton & Santa Fe in connection with the acquisition of the subsidiary lines.

The Oklahoma, New Mexico & Pacific extends from Ardmore, Okla., to Ringling, 30 miles. The Ringling & Oil Fields connects with the Oklahoma, New Mexico & Pacific at a point about 22 miles west of Ardmore and extends about 6 miles to Healdton. The Oklahoma, New Mexico & Pacific is now operating both lines and connects with the Gulf, Colorado & Santa Fe at Ardmore.

BROOKSVILLE & INVERNESS.—*Bonds.*—The Interstate Commerce Commission has granted authority for the issuance of \$650,000 of first mortgage 6 per cent bonds, series A, to be delivered to the Seaboard Air Line, in repayment of advances.

CHICAGO & ILLINOIS WESTERN.—*Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to issue \$489,000 of equipment trust certificates.

CHICAGO, BURLINGTON & QUINCY.—*Abandonment of Branch.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of a branch from a point on the main line near Guernsey, Wyo., to Ironton, 9.74 miles. The line was built to serve an iron mine which has since ceased operations.

CHICAGO, MILWAUKEE & GARY.—*Final Valuation.*—The final value for rate-making purposes of the property owned and used for common-carrier purposes is placed at \$2,789,475 as of 1915, in a final valuation report by the Interstate Commerce Commission. The report states that as of December 31, 1921, the property of the carrier was transferred to the Chicago, Milwaukee & St. Paul for a consideration of \$3,000,000, which transfer was later ratified by the commission. "It was contended," the report says, "that in assigning a final value of less than that sum to this property a grave injustice would be done the purchaser. The protestant apparently has overlooked the fact that our tentative final value of \$2,889,475 for property owned and used does not include the sum of \$149,650.53 stated in the tentative valuation as the value of non-carrier property owned by the carrier on the date of valuation. Moreover, when the valuation is brought to a later date the carrier will receive credit for whatever net additions and betterments have been made between date of valuation and December 31, 1921, and they should be considered in making a comparison of the valuation herein found with the purchase price of \$3,000,000." The final valuation now reported is \$100,000 less than the tentative valuation.

GULF, MOBILE & NORTHERN.—*Operating Agreement Approved.*—The Interstate Commerce Commission has approved the arrangement whereby this company will operate in freight service jointly with the Nashville, Chattanooga & St. Louis, the line of the Louisville & Nashville between Jackson, Tenn., and Paducah, Ky. The line in question is 145.33 miles in length, is owned by the Louisville & Nashville and leased to the Nashville, Chattanooga & St. Louis. The Gulf, Mobile & Northern by this arrangement will connect at Paducah with the Chicago, Burlington & Quincy, and supply a new route to the Gulf of Mexico.



Korean Porters Soliciting Business at Chinese Eastern Station, Vladivostok

HOCKING VALLEY.—Notes.—This company has applied to the Interstate Commerce Commission for authority to issue \$6,000,000 5 per cent secured gold notes, to be used to retire a like amount of notes maturing on September 1, and to pledge \$7,500,000 of general mortgage bonds as collateral security therefor.

INTERNATIONAL-GREAT NORTHERN.—Bonds.—The Interstate Commerce Commission has authorized an issue of \$9,943,000 of first mortgage 30-year 5 per cent bonds, \$6,000,000 thereof to be sold at not less than 92¾ and \$3,943,000 to be pledged as collateral security for short term notes.

MINNEAPOLIS & ST. LOUIS.—Receiver's Certificates.—The Interstate Commerce Commission has granted authority for the issuance of a certificate or certificates in an aggregate amount of \$200,000, bearing interest at not to exceed 7 per cent per annum, the proceeds to be used to refund a certificate of like amount bearing interest at the rate of 5 per cent, which matured August 3.

MONONGAHELA.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Chartiers Southern by purchase of stock and by lease, of the Indian Creek & Northern by purchase of stock and by lease, and also to lease the Catawba branch and part of the Paw Paw branch of the Baltimore & Ohio and to operate over the line of the Pennsylvania from Brownsville Junction to Millsboro, Pa.

NEW YORK CENTRAL.—Lease of Controlled Companies.—As a further step in the direction of consolidating its system the New York Central has applied to the Interstate Commerce Commission for authority to lease for 99 years the Cleveland, Cincinnati, Chicago & St. Louis, the Michigan Central and the Chicago, Kalamazoo & Saginaw, which it has long controlled by stock ownership, and the Big Four has filed a separate application for authority to lease the Cincinnati Northern and the Evansville, Indianapolis & Terre Haute. The leases are to include the subsidiaries of these companies operated under lease and it is proposed to transfer to the New York Central the Peoria & Eastern and the Kankakee & Seneca for operation in conformity to the Big Four's contracts. Through the proposed leases, the application says, "economies will be effected and improved service will result in the administration and operation" of the lines.

According to the application the New York Central now owns 84.694 per cent of the preferred stock of the Big Four and 91.308 per cent of the common stock. It also owns 99.145 per cent of the outstanding stock of the Michigan Central and 40 per cent of the Chicago, Kalamazoo & Saginaw, the remaining 60 per cent being owned by the Michigan Central. The provisions as to rental provide for the payment of 5 per cent a year on the preferred stock and 10 per cent on the common stock of the Big Four and 50 per cent on the stock of the Michigan Central, excluding the stock held by the lessee in each case except that deposited as collateral. Provision is also made for the purchase of the minority stock at a "fair value," to be fixed by three appraisers in case of disagreement as to price. The application states that the lines to be acquired are complementary to, rather than competitive with, its lines.

NORTHERN PACIFIC.—Guaranty.—The Interstate Commerce Commission has issued a corrected certificate to the Secretary of the Treasury stating the amount of this company's guaranty for the six months' period following the termination of federal control as \$10,679,758. The company had already received \$12,000,000 in advance and partial payments and the commission recently issued a decision reviewing the case and holding that the company had been overpaid and owed the amount of the excess to the government. As to the company's subsidiaries the certificate stated the amount due the Big Fork & International Falls to be \$30,527, of which it had received \$25,000; that the amount due the Billings & Central Montana was \$4,118; that the amount due the Minnesota & International was \$192,117 and that it had been paid \$150,000, and that the Gilmore & Pittsburgh owes the government \$1,427.

PENNSYLVANIA.—Lease.—The Interstate Commerce Commission has authorized subject to conditions, the lease of the Pennsylvania, Ohio & Detroit.

PORTLAND & RUMFORD FALLS.—Bonds.—This company and the Maine Central have applied to the Interstate Commerce Commission for authority for an issue of \$890,000 of 5 per cent first mortgage sinking fund bonds of the P. & R. F., to be guaranteed by the Maine Central, for the purpose of refunding bonds that mature in the near future.

SEABOARD AIR LINE.—Bonds.—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of \$652,500 of first and consolidated mortgage gold bonds, series A, said bonds to be pledged and repledged from time to time for short-term notes.

Authority has also been granted to issue refunding-mortgage bonds in an amount which, when taken at their fair market value at the time of pledge, will not exceed \$1,878,096, said bonds to be pledged under applicant's first and consolidated mortgage; and to issue not exceeding \$2,114,500 of first and consolidated mortgage gold bonds, series A; said bonds to be pledged and repledged from time to time as collateral security for short-term notes.

SOUTHERN PACIFIC.—Abandonment.—The Interstate Commerce Commission has authorized the abandonment by this company and the New Mexico & Arizona of a line from Benson, Arizona, to Fairbank, 15.6 miles.

WEATHERFORD, MINERAL WELLS & NORTHWESTERN.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$572,000 of equipment trust certificates.

YORK HARBOR & BEACH.—Abandonment.—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Kittery Junction to York Beach station, Maine, 11 miles.

Average Price of Stocks and Bonds

| | Aug. 3 | Last Week | Last Year |
|---|--------|-----------|-----------|
| Average price of 20 representative railway stocks | 98.40 | 95.84 | 83.63 |
| Average price of 20 representative railway bonds | 96.83 | 96.56 | 90.03 |

Dividends Declared

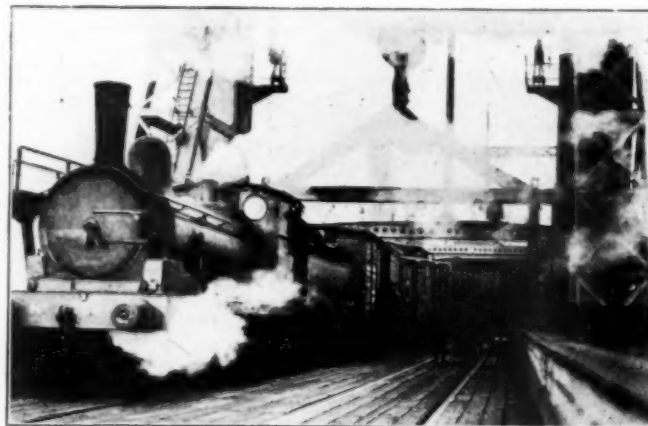
Buffalo, Rochester & Pittsburgh.—Common, \$2, semi-annually; preferred, \$3, semi-annually; both payable August 16 to holders of record August 9.

Cleveland & Pittsburgh.—Regular guaranteed, 1¾, quarterly; special guaranteed, 1 per cent, quarterly; both payable September 1 to holders of record August 10.

Cripple Creek Central.—Preferred, 1 per cent, payable September 1 to holders of record August 14.

New York, Chicago & St. Louis.—Common, 2¼ per cent, quarterly; preferred, 1½ per cent, quarterly; both payable October 1 to holders of record August 16.

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Wide World

British Soldiers and Equipment from Cologne Direct to England Without Change of Cars Via Zeebrugge-Harwich Train Ferry—Cars Being Docked at Harwich

Railway Officers

Executive

J. F. Hogan, general freight agent of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been elected vice-president of the Chicago & Western Indiana and the Belt Railway of Chicago, with the same headquarters, a newly created position.

Financial, Legal and Accounting

Ralph B. Boyle has been appointed local auditor of the New York, New Haven & Hartford, with headquarters in New York City. Mr. Boyle will undertake a large part of the work formerly done by W. S. Rathbun, deceased.

E. K. Scott, secretary and auditor of the Kentucky & Indiana Terminal, with headquarters at Louisville, Ky., has resigned to engage in other business and **Frank J. Flispart** has been appointed acting secretary and acting auditor.

Maury Middleton, who has been elected treasurer of the Southern, with headquarters at Washington, D. C., was born on January 3, 1880, in Washington, and attended the public schools of that city.



Maury Middleton

He entered the service of the Southern in 1899, as a clerk, and was promoted to chief clerk in 1907. A year later he became assistant cashier, and from 1914 to 1918 he served as assistant treasurer and assistant cashier. During the period of federal control he was local federal treasurer of the Southern Railroad, and upon the return of the roads to their owners, became assistant local treasurer of the Southern Railway Company. Later in 1920 he was promoted to assistant treasurer, and held that position until his recent promotion to treasurer.

Operating

C. W. Exline has been appointed trainmaster of the Illinois division of the Missouri Pacific and of the Coal Belt Electric Railroad, with headquarters at Bush, Ill., succeeding **W. H. Ashley**.

O. F. Ohlson, assistant superintendent of the Montana division of the Northern Pacific, with headquarters at Billings, Mont., has been promoted to superintendent of the Yellowstone division, with headquarters at Glendive, Mont., succeeding **F. C. Huntington**, who has been assigned to other duties. **R. T. Taylor**, superintendent of icing facilities, with headquarters at St. Paul, Minn., has been appointed assistant superintendent of the Montana division in place of Mr. Ohlson.

M. B. Lamb, superintendent of the Hannibal division of the Chicago, Burlington & Quincy, with headquarters at Hannibal, Mo., has been given extended jurisdiction to include the Brookfield division which has been consolidated with the Hannibal division, with headquarters remaining at Hannibal. **J. E. Carroll** has been appointed assistant super-

intendent of the Hannibal division, with headquarters at Brookfield, Mo. **W. R. Eble** has been appointed trainmaster with headquarters at Hannibal.

C. R. Young, who has been promoted to superintendent of transportation of the Illinois Central, with headquarters at Chicago, was born on May 25, 1885, at Oakland, Ky., and



C. R. Young

entered railway service in April, 1906, as a stenographer on the Illinois Central. From 1908 to 1909 he was employed as a time-keeper and from 1909 to 1910 as a car distributor. Mr. Young was promoted to assistant chief clerk to the general superintendent in 1911, and held that position until 1917, when he was promoted to chief clerk to a division superintendent. He was made yardmaster and train auditor in 1918 and in 1919 was promoted to trainmaster. Mr. Young was

appointed superintendent of the Tennessee division, with headquarters at Fulton, Ky., in July, 1920, and was later transferred to the St. Louis division, with headquarters at Carbondale, Ill. He remained there until his recent appointment as superintendent of transportation.

Traffic

C. L. Senter has been appointed assistant general freight agent of the Seaboard Air Line, with headquarters at Norfolk, Va.

E. L. Burbank has been appointed assistant general freight agent of the Illinois Central, with headquarters at Chicago, succeeding **George W. Becker**, deceased.

J. W. E. Trefz, traveling freight agent of the Chicago, Rock Island & Pacific, with headquarters at El Paso, Texas, has been promoted to general agent, with headquarters at Phoenix, Ariz., succeeding **R. R. Seeds**, deceased.

J. V. Carroll, district freight and passenger agent of the Union Pacific, with headquarters at San Pedro, Cal., has been promoted to general agent, with the same headquarters, a newly created position, and the position of district freight and passenger agent has been abolished. **S. C. Frost**, district freight and passenger agent, with headquarters at Ocean Park, Cal., has been made general agent, with the same headquarters, and the position of district freight and passenger agent has been abolished.

F. L. Orr, assistant general passenger agent of the International-Great Northern, with headquarters at San Antonio, Tex., has been appointed general passenger agent of the Missouri Pacific, with headquarters at Kansas City, Mo., a newly created position. **J. L. Fisk** has been appointed assistant general passenger agent, with headquarters at St. Louis, Mo., succeeding **H. H. Muchall**, promoted to assistant to the passenger traffic manager. **E. A. Farr**, division passenger agent, with headquarters at Houston, Tex., has been promoted to assistant general passenger agent, with headquarters at San Antonio, in place of Mr. Orr.

J. H. Ketner, who has been appointed assistant freight traffic manager of the Seaboard Air Line, was born on October 25, 1877, at Atlanta, Ga. He was educated in the public schools of that city, and Washington, D. C., and entered railroad service in December, 1897, at Washington, as clerk in the office of the traffic manager of the Southern, and held various clerkships in the offices of the traffic manager and

general freight agent of that company at Washington and Atlanta until 1902, when he resigned from railroad service to take up the study of surgery. Mr. Ketner returned to railroad service in August, 1903, as rate clerk in the office of the assistant general freight agent of the Seaboard Air Line at Savannah, Ga., and on January 1, 1904, became chief clerk in the same office. In March, 1905, he was transferred to Montgomery, Ala., as commercial agent. In November, 1908, he was transferred to Norfolk, Va., in charge of the commerce department, organized at that time to handle cases before the Interstate Commerce Commission and state commissions. In January, 1912, he was appointed assistant to the general freight agent, in charge of the same department; and on July 1, 1916, was appointed assistant general freight agent. In March, 1920, Mr. Ketner was appointed general freight agent, continuing in that position until his recent promotion to assistant freight traffic manager at Norfolk, Va. In this position Mr. Ketner has jurisdiction over all complaints before the Interstate Commerce Commission and state commissions, refrigeration and other protective service, and rates, rules and regulations involving fruit and vegetable traffic.

Mechanical

E. R. Dowdy has been appointed master mechanic of the Chesapeake & Ohio, with headquarters at Richmond, Va., succeeding **F. B. Moss**, deceased.

T. E. Paradise, master mechanic of the Hannibal division of the Chicago, Burlington & Quincy, with headquarters at Hannibal, Mo., has been given jurisdiction also over the Brookfield division which has been consolidated with the Hannibal division. **F. R. Butts** has been appointed assistant master mechanic of the Brookfield division, with headquarters at Brookfield.

Engineering, Maintenance of Way and Signaling

William F. Zane, who has been promoted to signal engineer of the Chicago, Burlington & Quincy, with headquarters in Chicago, was born on October 1, 1882, at Odebolt, Iowa, and was educated at Highland Park College, Des Moines, Iowa, being graduated in June, 1903. He entered railway service as a rodman on the Burlington on September 15, 1903, and after holding various positions in the engineering department, was transferred to the signal department as a draftsman in 1904. He was subsequently promoted to office engineer, and in 1913, was appointed signal inspector. In 1917, Mr. Zane was promoted to assistant signal engineer, lines west of the Missouri river, with headquarters at Lincoln, Neb., which position he held until his recent promotion to signal engineer of the system.

O. S. Major, senior signal engineer with the Bureau of Signals and Train Control Devices of the Interstate Commerce Commission, has been appointed signal engineer of the Kansas City Southern, with headquarters at Kansas City, Mo., succeeding **H. F. Haag**, deceased.

C. C. Williams, head of the civil engineering department of the University of Illinois and prior to 1922 professor of railway engineering at the University of Kansas, has been appointed dean of the College of Applied Science at the State University of Iowa, Iowa City, to succeed **William G.**

Raymond, whose death was noted in the *Railway Age* of June 26.

E. L. Mead, division engineer of the Black Hills and Wyoming divisions of the Chicago & North Western, with headquarters at Chadron, Nebr., has been transferred to the Galena division, with headquarters at Chicago, succeeding **J. S. Robinson**, who has retired. **C. H. Wells**, division engineer of the Southern Illinois division, with headquarters at South Pekin, Ill., has been transferred to the Black Hills and Wyoming divisions in place of Mr. Mead. **L. M. Bates** has been appointed division engineer of the Southern Illinois division, succeeding Mr. Wells.

Obituary

H. A. Kennedy, vice-president of the Minnesota Transfer, with headquarters at St. Paul, Minn., died at his home in that city on July 30.

W. E. Wolfenden, general passenger agent of the Pere Marquette, with headquarters at Detroit, Mich., died at Battle Creek, Mich., on July 30, after a long illness.

James W. Deen, formerly division engineer of the Denver & Rio Grande Western, with headquarters at Salida, Colo., who retired from active service in September, 1923, died at Salida on July 27 after an operation for appendicitis.

Frank A. Torrey, formerly general superintendent of motive power of the Chicago, Burlington & Quincy, who retired on November 1, 1922, after 48 years of railway service, died at his home in LaGrange, Ill., on July 29. He was born in Pennsylvania on October 6, 1856, and entered the service of the Burlington in 1874 as an apprentice in the machine shop at Burlington, Iowa. He was later employed as a locomotive fireman and as a locomotive engineer and was made road foreman of engines in February, 1887. Mr. Torrey was promoted to master mechanic of the Ottumwa division on April 1, 1889, and was transferred to the Creston division in March, 1902. On September 1, 1903, he was made assistant superintendent of motive power, with headquarters at Chicago, and two years later was promoted to superintendent of motive power of the lines east of the Missouri river. Mr. Torrey was appointed general superintendent of motive power of the system on January 1, 1911, and held that position until his retirement.



F. A. Torrey



W. F. Zane

THE LATEST ISSUE of the Southern Field, published by the development service of Southern Railway, is devoted to the 1926 competition for the Southern Railway corn cup. This is a silver cup awarded annually for the best ten ears of any variety of field corn grown and exhibited by the farmer in any one of the following states: Alabama, Georgia, Kentucky, Mississippi, North and South Carolina, Tennessee or Virginia. Competitors in each state will enter their exhibits at any one of the fairs designated in that state where they may first compete for the prizes offered by that fair. The ten-ear exhibit judged to be the best entered in competition at each fair is sent in a sealed package to the general agricultural agent, Southern Railway, Atlanta, Ga., with a letter certifying the name and post office address of the grower and exhibitor of the corn, and the county in which it was grown. As soon as the prize winning exhibits have been received from all of the fairs designated, the cup will be awarded by three judges.